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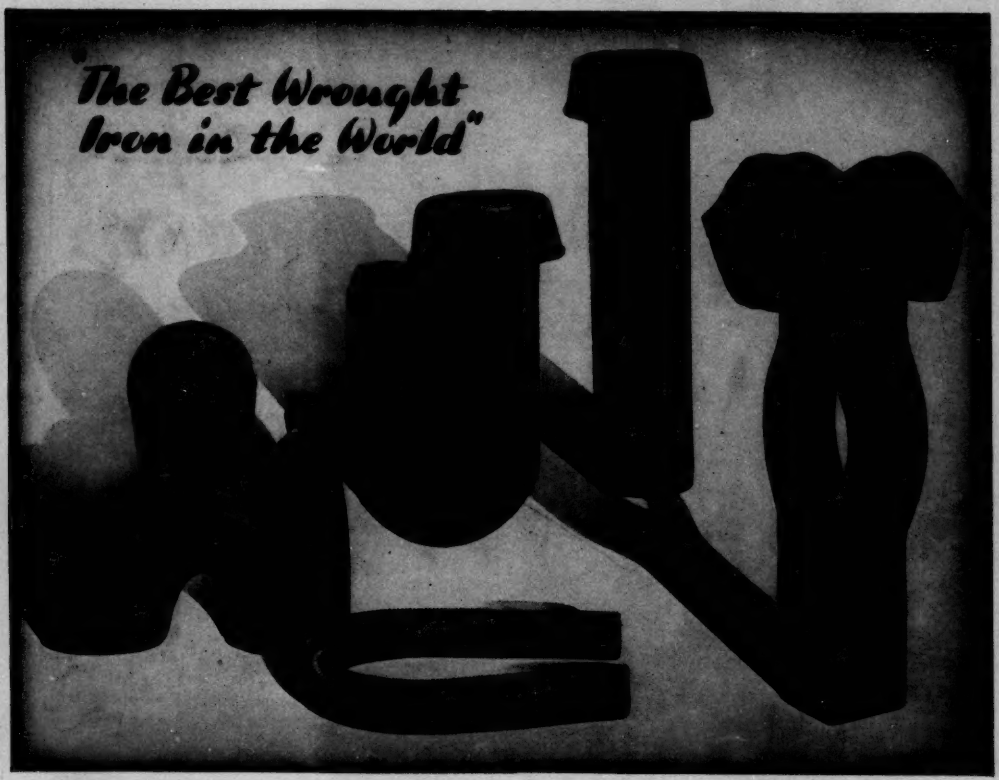

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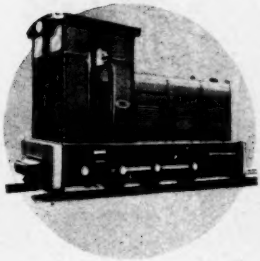

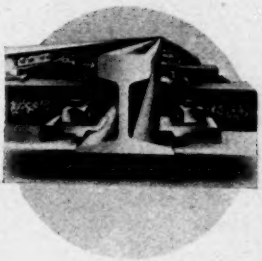

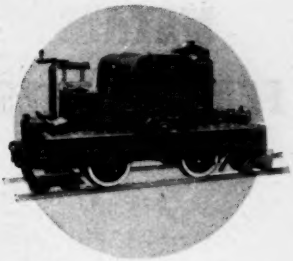

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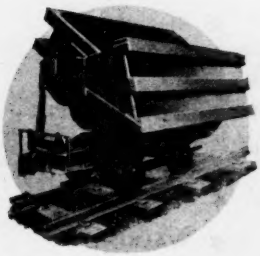

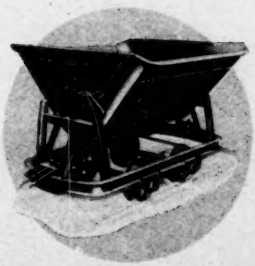

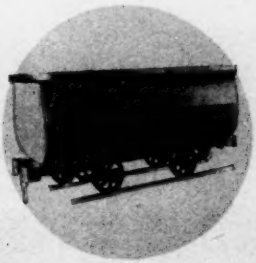

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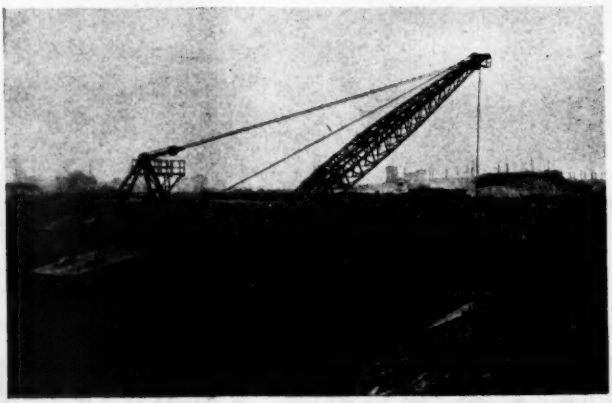

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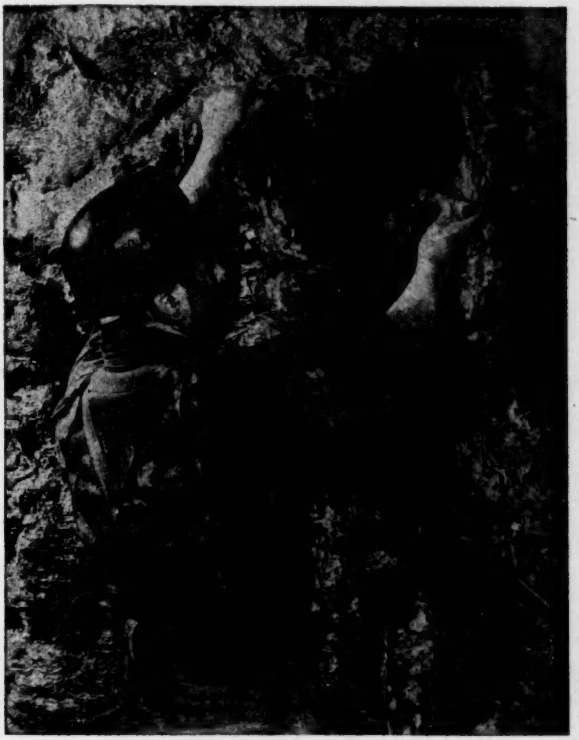

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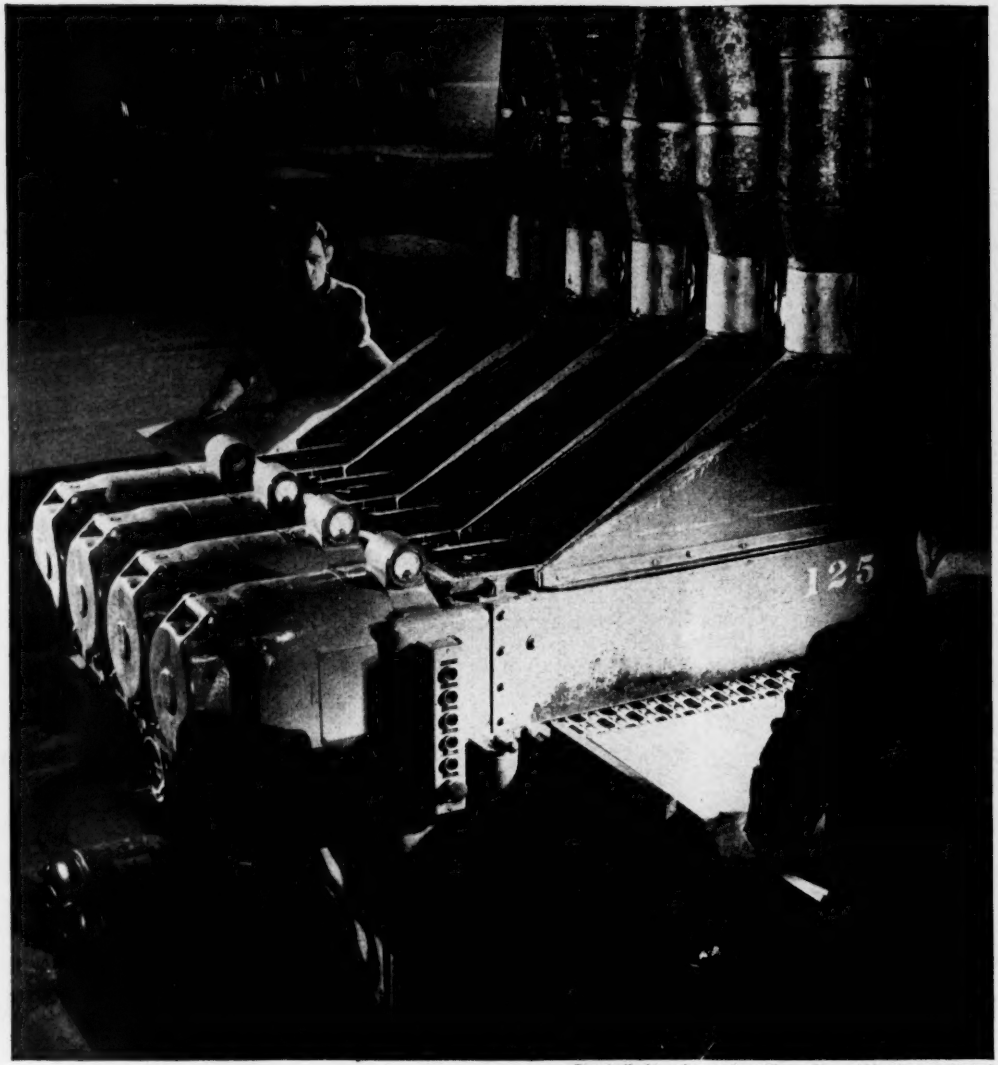

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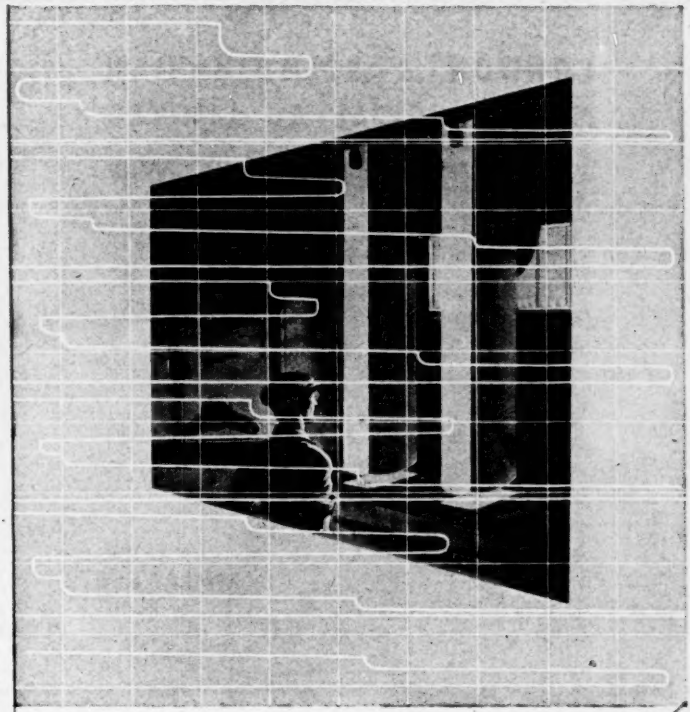

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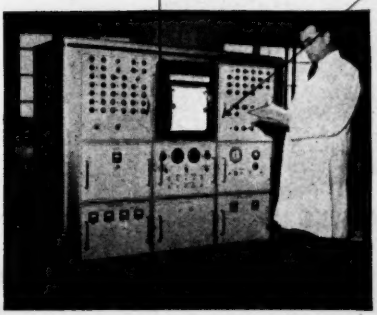

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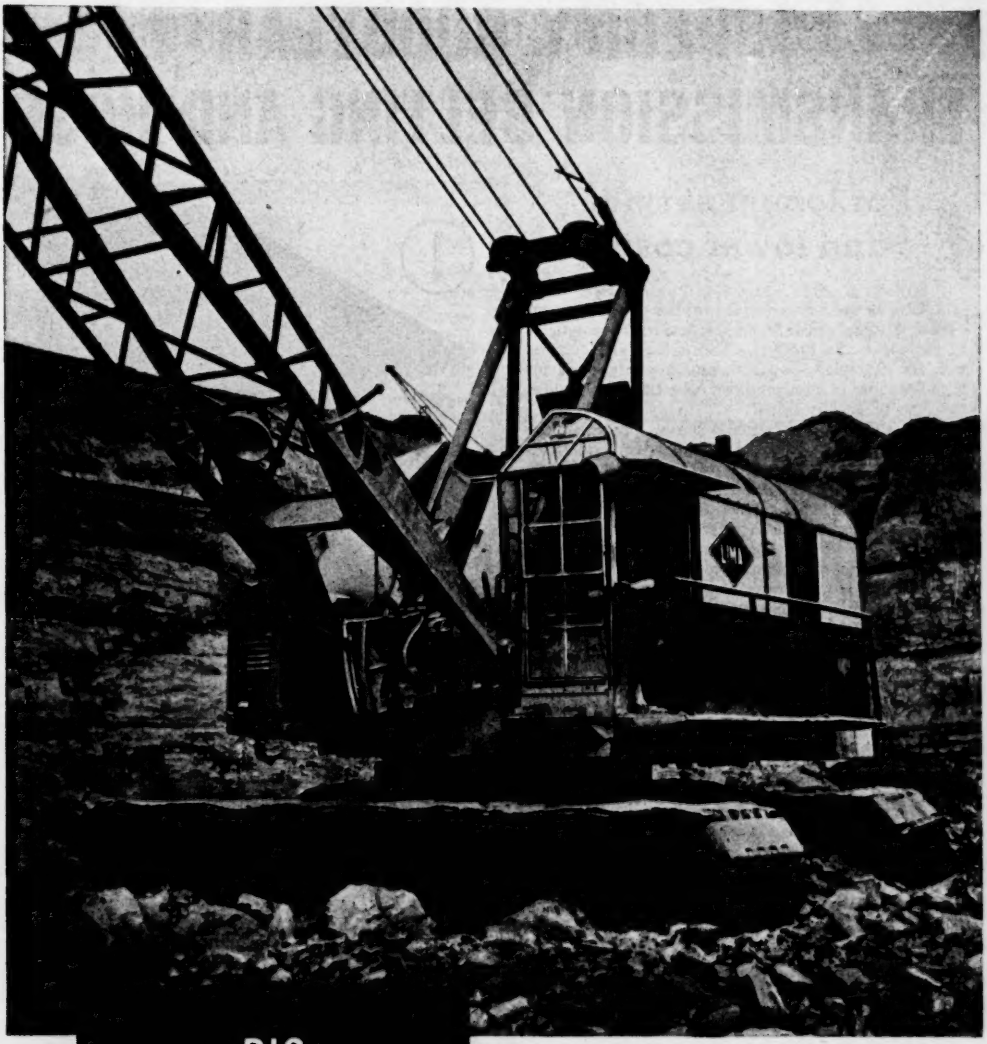

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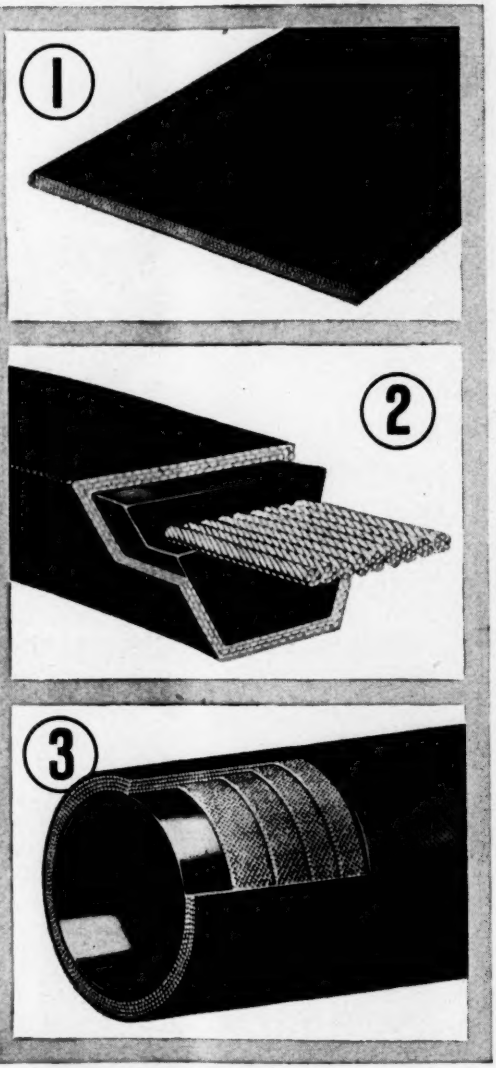

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CONTENTS

Notes and Comments 469
From Our Australian Correspondent 471
Mineral Resources in Nyasaland 472
Use of Radioactive Isotopes in Industry 473
The Dosco Miner 474
Machinery and Equipment 476
Metals, Minerals and Alloys 477
The Mining Markets 479
Company News and Views 480
Mufulira and Roan; Ashanti; Bibiani; British Guiana.
Company Shorts 481
Company Meetings 481
British Guiana Consolidated Goldfields; Welkom Gold Mining Co., Ltd.; Free State Geduld Mines, Ltd.; President Steyn Gold Mining Co., Ltd.; President Brand Gold Mining Co., Ltd.; The British Aluminium Co., Ltd.; Rand Mines, Ltd.; Anglo-Transvaal Consolidated Investment Co.

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NOTES AND COMMENTS

South African Uranium Developments

According to a statement made in the Senate by Mr. J. H. Viljoen, Minister of Mines, South Africa is expected to commence the production of uranium from gold bearing ores within the next five weeks. The importance of this new industrial development to the Union's economy was given briefly when Mr. N. C. Havenga, Minister of Finance, said in his budget speech that it was anticipated uranium exports from South Africa would add "a substantial amount" to the nation's foreign exchange income from 1953 onwards.

Information regarding uranium developments in South Africa has been given recently in the Assembly and the Senate by the Minister of Mines in dealing with the Atomic Energy Amendment Bill. The paramount design of this legislation is the simplification of procedure for negotiation with the mining industry. According to the Minister, the original Bill was not flexible enough in this respect.

Extremely successful negotiations in connection with the sale of uranium have resulted in the signing of a satisfactory agreement between the Union, Britain and the United States. Intensive negotiations have proceeded during the past two years, and it is anticipated that the capital necessary to initiate production will be provided by means of loans in Britain and America.

Official reports stress that the Union has no intention of stockpiling uranium now, but in terms of her agreement with the two other signatories, she is empowered to retain a portion of the production for her own use. In co-operation with the University of Witwatersrand, the Government metallurgical laboratories in Johannesburg are already proceeding with analytical work on uranium ores. Speaking in the Senate, Mr. Viljoen announced he had the right to make quantities of uranium available to universities for purposes of research. Foremost scientists there, were engaged in useful research work.

Production of uranium in South Africa will be undertaken by certain gold mines which will sell the product to the South African Atomic Energy Board. In the opinion of both the Government and the mining industry the production will prove to be financially sound.

Output of uranium from South Africa will be nearly 300 per cent of the figure contemplated when the original agreement was signed between the three countries in 1950. In addition, production will be undertaken by three times as many mines as was originally contemplated. The first mine likely to reach the point of production is on the West Rand.

Commenting on a statement in the Assembly that uranium production placed South Africa in a vulnerable position, the Minister of Mines pointed out that the producing mines would be scattered over a considerable area. Some of the Free State mines would be drawn into the production orbit, which would thus not be concentrated in a diminished locality.

Optimistic Future for Canadian Aluminium

Mr. N. V. Davis, president of Aluminium Ltd., spoke of the expectation of a "healthy demand over the years" for the output of aluminium from existing and planned ingot producing facilities when he addressed the annual meeting of the company's shareholders in Montreal during late April. Negotiations were under way for the issue of $90,000,000 worth of debentures by the Aluminium Company of Canada Ltd., which would be offered in the United States and would be guaranteed by Aluminium Ltd., the parent company. Pending completion of this financing, Alcan has concluded arrangements with a number of Canadian and American commercial banks for one year lines of credit aggregating $90,000,000.

Mr. Davis pointed out that there were likely to be dislocations and even periods which would promote the difficulty of oversupply when the demands of defence diminished before the expansion of facilities for ingot production. "Yet the past and the probable future relationship of aluminium to competitive materials, with the extensive and highly developed fabricating capacity in the industrialized markets and the development potential of other areas, should create over the years a healthy demand for the existing and planned ingot producing facilities."

Mr. Davis stressed that the Company would endeavour to share in the satisfying of the overall demand by making ingot available at economic prices, and by assisting in the further development of the fabricating in areas where economic and political considerations and the demand for

development decreed such steps. Price relationships indicated that aluminium could now regard itself as having obtained a position where, in the future, it could with reason expect to compete favourably in a large number of applications with the majority of the common non-ferrous metals. Indeed, the long range view seemed to favour the future of aluminium over those of its non-ferrous competitors, after a consideration of the relative economies of production under present methods and the known availability of raw materials.

Important segments of the existing aluminium fabricating facilities were not being utilized, either as a result of the shortage of aluminium for commercial purposes or because such facilities could not be used for defence production. This state of affairs applied to many of the highly industrialized areas of the world and particularly to the United States and Britain. It was encouraging to see that established and highly experienced fabricators of other metals were devoting more of their facilities to the fabrication of aluminium. Mr. Davis stated, therefore, that in the industrialized markets a currently idle portion of the fabricating industry might be considered a reserve potential for the future commercial utilization of aluminium.

In recent years the Company had increased its exports to Britain and the United States and the Aluminium Company of Canada Ltd. had submitted a revised offer to American authorities to supply the American market with 1,110,000 s.tons of aluminium ingot between 1952 and 1958. The acceptance of the offer would not necessarily mean that the Company's expansion and financing programme would be altered.

Mr. Davis remarked that the fractional replacement of steel with aluminium, although insignificant in relation to overall steel production, would have a marked effect on demand for aluminium.

The annual report of Aluminium Ltd. gives interesting details of the programme being carried out by the Aluminium Company of Canada Ltd. in British Columbia. The activities are represented as involving the construction of the first "pivotal phase" of a potentially large hydro-electric and aluminium realization in the West that ultimately will be capable of producing 1,600,000 h.p. of firm electric energy and 500,000 tonnes of aluminium per year. Initial arrangements provide for the installation of 450,000 h.p. of generating capacity and the construction of 83,000 tonnes of annual ingot smelting capacity. Production of aluminium is planned to begin in 1954, with the use of about 300,000 h.p. Expenditures for the first phase of the project are currently estimated at $195,000,000.

Precious Metals Control in Japan

Japan re-entered last week the comity of nations as a result of the ratification of the Peace Treaty of San Francisco. In this connection, it appears to be opportune to register the fact that controls on gold will be reduced, and silver will be freed from control, if the Diet approves a Bill recently drafted by the Japanese Government for the revision of the Precious Metals Control Law. According to reports received in London from Tokyo, no tangible difficulties are expected to impede the passage of this Bill, which should thus become law within a month or two.

As regards the price of gold, the Japanese Government is willing to admit the sale of non-monetary gold at a new official price commensurate with the free gold price overseas. However, the intended introduction of a free price system has been superseded by the Finance Ministry's proposal for the establishment of a multiple price system according to the use made of the yellow metal. Put in a nutshell, the system will work as follows—the Government will buy gold, newly mined or otherwise, at the official price of 401 yen per gramme and afterwards will sell back a certain amount to producers in proportion to the quantity they have handed over to the Government. In this case, the Government will not charge more than the official price plus a small commission payable to the Mint. Producers can sell gold only to special dealers authorized by the Ministry of Finance. Consumers, on the other hand, cannot buy the metal from dealers unless they have obtained from the Government a certificate providing evidence in respect of its eligible use. The new official prices applicable to mining companies, dealers, and consumers for the sale and repurchase of non-monetary gold will be announced when the revised law becomes effective. However, there appears to be an inter-departmental tussle going on between the Ministry of Finance which wants to fix them around 500 yen, and the experts of the Ministry of International Trade and Industry who are in favour of a price of 600 yen per gramme in order to promote the interests of the gold mining industry, which attained an output, last year, of some 190,000 oz., of which nearly half was used for non-monetary purposes.

As regards silver, the domestic price, now pegged at 9,700 yen per kilogramme, is considered to be too high in the light of international market quotations and, moreover, domestic consumers will not absorb more than 5,000,000 oz. at best against an estimated output of 6,450,000 oz. this year. The domestic price is thus likely to come down, but meanwhile the silver mining companies are reported to be pressing the Government for authorization to export their surplus silver together with government-held stocks of some 13,500,000 oz.

Shetland's Magnetic Ore Deposits Investigated

During the last two years, leading London geologists and scientists have spent considerable time exploring the possibilities of the magnetic ore deposits known to exist in certain parts of the mainland of Scotland and the northern Shetland Isles.

In April this year, geologists examined samples of the sand on the small island of Feltar. This sand is almost black in colour and has a high magnetic content. They stated that the exploitation of the deposits would require the expenditure of large sums of money and at least ten years work. Previous attempts were made by the Army during the last war to mine the magnetic ore on the mainland, but the project was abandoned after the invasion of North Africa, as it was more economic to obtain the ore from there.

Several tons of the magnetic sand will be shipped from Feltar to the mainland for experimental purposes.

Dr. Williamson Resumes Diamond Exports

Diamond exports from Tanganyika rose sharply from £11,155 in January to no less than £224,500 in February. This sharp increase is due, it is thought, to the resumption of exports from the Mwadui Mine under the control of Dr. John T. Williamson. Thus it can be assumed that the diamonds which Dr. Williamson recently offered in London were new exports.

It may be recalled that Dr. Williamson ceased exporting diamonds in June, 1950, because of a dispute with the De Beer's Group. Although his agreement to sell through The Diamond Trading Co. ended on September 31 last, leaving him free to dispose of his diamonds as he wished, he exported nothing in January, the whole of the output recorded coming from the Alamasi Mine, Tanganyika's other diamond producer.

Australia

(From Our Own Correspondent)

Melbourne, April 30.

Figures just issued show that the gold production in Australia for 1951 totalled 870,653 f.oz., an increase of 1,246 f.oz. compared with the previous year. This slight increase merely tends to show the stagnant condition of the industry and that existing conditions offer no incentive to activity in the directions available for enterprise. Employment figures are low, being 10,872 men in 1950, which is the last year available, but it can be accepted that there has been little, if any, increase in 1951. Another striking commentary on the condition of the industry is that in the period of 1950-51, Australia imported more gold than in any other year since 1938-39, in which period the country exported gold to the value of £A.17,843,080, which compares with an export in 1950-51 valued at £A.294. Value of gold imported in 1950-51 was £A.2,457,994. The trouble lies in increasing lack of incentive to effort, due to inadequate margin of profit to compensate the risks involved. Much of the trouble can be attributed to Government controls on industry, and in none more definitely than in coal mining where such controls have caused profits to diminish to a point at which the industry offers no inducement to investment; concurrently with the decrease in attraction for investment, shortage of coal for industry has developed rapidly.

Attention has been drawn recently to the latent wealth of Western Australia in base metals, the importance of which has, hitherto, been passed over because of the attraction of the gold mining industry. There is, however, no incentive to development of base metals, due primarily to taxation and restrictive conditions in industrial awards. The inevitable result, which seems to be more or less ignored, is that the demand for metals can no longer be met by the mines at present working, and the country's increasing needs are being met by growing imports instead of by encouraging attention to the mineral resources which still remain neglected, because of lack of profit incentive.

INCREASED COAL PRICES SOUGHT

Following an offer by the Joint Coal Board, respecting the price of coal, 42 colliery proprietors in New South Wales have applied for a higher price for coal produced by them. The offer was 6s. per ton profit at the pithead, or 25 per cent on capital, before taxation, but after allowing for an annual preference dividend. Some increases of up to 4s. per ton have been granted. The price fixing will be based on certified and recognized costs, of the individual producers. Certain provisions of the offer include the following: Sinking fund and depreciation of 10 per cent per year will be allowed before the profit is struck. Adjustment may be made in cases where the life of the mine is less than 10 years or if under normal income tax procedure a greater depreciation percentage was allowed previously. The price may be adjusted by the Board according to basic wage fluctuations. Proprietors who take advantage of the plan are not allowed to pay a dividend in excess of 10 per cent without the approval of the Board. The object of the plan appears to be to place individual collieries in a better financial position to carry out mechanization, and generally, to modernize workings and working conditions. In recent years the financial position of many mines has been such, under fixed price for coal and constantly rising costs, that profits were very small; dividends, if paid, usually represented a very inadequate return on capital, and there was no incentive to new enterprise, nor means to improve existing mining practice. The natural repercussion will be general increase in the costs of all fuel users, and such costs are approaching a prohibitive level. A more satisfactory approach, but one that, at the moment, seems impossible of realization, would be greater production for the capital already invested, through elimination of strikes, and the operation of mechanical units closer to their full capacity.

Actually, present economic troubles are largely due to decreased rate of output and greatly increased rates of wages. The position is strikingly emphasized by the fact that in a period of years in which colliery mechanization has increased from practically zero to nearly 40 per cent, production per man shift has declined by approximately 0.6 ton, based on total colliery employees. The urgency of increased output is evident from the estimates which show that to meet coal requirements in 1954, production of black coal must be increased by nearly 50 per cent and that four years' effort by the Joint Coal Board has raised output in 1950 by only 14¼ per cent. The disturbing feature is that despite very large reserves of coal locked up in pillars because of union opposition to pillar working, and a wide scope for new underground enterprise, underground production has remained practically static—despite mechanization—and development of open cut mining, of which possibilities are definitely limited, has been responsible for increased, though still lagging, output.

SMALL COMPANY FINANCE

One of the great obstacles to small company success in Australia has been the traditional policy of failure to provide reserve funds to carry development over lean productive periods, and numerous mines have been abandoned on the working out of the first shoot, or series of ore shoots, because all profits had been distributed as earned, no reserve fund had been set aside against the need for prospecting for new ore and shareholders, after a period of dividends, were unwilling to return to the payment of calls. The latest example of this policy is given by the North Deborah Mining Co., at Bendigo. This company was formed in 1937, and commenced the payment of dividends in 1939, since when a total of £A.686,000 has been distributed. The inevitable non-productive period has arrived, when it is necessary to explore for new ore, and the company, after a highly profitable run, in which an ample reserve should have been built up, is now forced on to the call list. This hunger for dividends at the expense of sound finance may well be said to be the curse of small mines, and to have done much harm to the industry.

URANIUM

Exploration for any development by the Government of promising uranium deposits continues to attract attention, although the first wave of enthusiasm by prospectors has passed. The South Australian Government has been active in the development of the Mount Painter field, in the Flinders Ranges, and Radium Hill near the New South Wales border. The latter now seems to be the centre of attention. According to official reports, and to statements by visiting authorities the area has considerable promise. The Government is proceeding with the erection of a sink-float plant, but it is not expected that production of concentrate will be commenced within a period of two years. Particulars as to development results are, of course, not being disclosed, but it seems certain that Radium Hill is likely to achieve some importance. In the Northern Territory, the same comment applies to Rum Jungle deposit, where again production is unlikely within two years. Rewards of £A.1,000 to £A.25,000 continue to be offered to prospectors, according to the value of the discoveries, but there seems to have been dissatisfaction over payments hitherto made, and interest amongst prospectors has waned seriously.

COLONIAL MINERALS DEVELOPMENT—IX

Mineral Resources in Nyasaland

By A. G. THOMSON

In the following article—the ninth in a series devoted to the mineral wealth of the smaller British overseas territories—details are given of Nyasaland's mineral resources, systematic mapping, and prospecting which is now being carried out by the Geological Survey. Special reference is made to coal and the potential monazite deposits.

The Nyasaland Protectorate is a narrow strip of territory bounded by Tanganyika on the north, by Northern Rhodesia on the west, and by Portuguese East Africa on the south, south-west, and east. It embraces the whole of the western and southern shores of Lake Nyasa, together with the high tablelands to the south of the Lake. The Protectorate lies entirely within the tropics and has an area of 47,949 sq. miles, including the lakes. At the end of 1950, the African population was estimated to be about 2,340,000, having almost doubled in 25 years. There were 3,280 Europeans and over 5,000 Asians.

So far, there has been only a very limited production of minerals, but mapping and prospecting are being systematically carried out. The staff of the Geological Survey comprises the Director and five geologists, together with one geologist loaned under the E.C.A. scheme. The work of the department is divided into three main sections, i.e., a mineralogical section, a water supply section, and a wells maintenance section.

The problem of water is of critical importance to Nyasaland. During the very serious drought of 1950, two geologists had to be diverted from mapping for several months to search for water as nearly all streams dried up and supplies at Blantyre, the principal town, were reduced to ten days' normal consumption. These and other water supply activities have made heavy demands on the staff. The Director of the Geological Survey is himself a most proficient geophysicist and his work has been of great benefit to the Colony in siting the wells from which underground supplies of water are obtained. Under the Director's personal supervision an iso-resistivity map was made of the Blantyre-Limbe area in order to assist in elucidating problems of local water supplies. It revealed a second high-yielding shear-zone some three miles west of the known Limbe zone. Great public interest was taken in this work, which has given valuable experience to officers of the Department. The question of legislation for the protection of water supplies and to ensure the notification of new works is being very carefully studied.

The British South Africa Company own half the mineral rights in Nyasaland. They did some prospecting about 1936, but no deposits of commercial importance were found. The country's known mineral resources include coal, bauxite and cement-making materials, but there is no actual production as yet. The Protectorate has a small output of corundum and a little mica and insignificant quantities of gold have been mined in the past. The coal occurrences are a continuation of the Tanganyika fields, which are at present being prospected, but otherwise there appears to be no link-up between any Nyasaland minerals and corresponding systems across the border.

COAL DEPOSITS

Investigations into coal deposits at Livingstonia were undertaken by Powell Duffryn Technical Services, assisted by the Geological Survey Department. A number of holes were drilled in 1950 and these operations showed the existence of a seam of good quality coal. The investigation of this coalfield was continued last year by a member of the Geological Survey and diamond drilling was carried out to ascertain how near the lake shore the known seams extend.

During 1950, mapping was started in the Mount Waller coalfield in the Northern Province. Time was also devoted to the supervision of the Mount Waller coal-drilling operations, and three holes have so far reached satisfactory depths. This work has shown the existence of a useful seam.

Mapping was also commenced in the Dowa District of the Central Province and near Blantyre in the Southern Province. The geological mapping of the Blantyre-Limbe area was completed last year and work is being continued towards the Portuguese boundary. Progress has been impeded by the nature of the terrain, which is rough, with over 2,000 ft. of relief, much of it being waterless in the dry season. Difficulties have also been presented by the keen competition for labour resulting from the large number of new ventures in the Blantyre district. This has made it increasingly hard to obtain carriers and labourers for survey work and to recruit African field staff.

A feature of this work was the discovery of two new ring structures; examination of air-photos shows that several other structures exist, but that not all of them appear to be petrologically similar. Small, unimportant finds of radioactive minerals were made.

INTERESTING MONAZITE OCCURRENCE

However, of much greater potential significance are occurrences of monazite and of the niobium-bearing mineral, pyrochlore, which have recently come to light. At this stage, it is still far too early to hazard any opinion as to their probable importance. The pyrochlore deposit is analogous to that at Sukulu in Uganda, while the monazite occurrence is of rather an unusual type, one of the most interesting features being that it is an occurrence *in situ*, whereas most of the world production comes from beach sands. Both the pyrochlore and the monazite are associated with the volcanic rocks of the Chilwa series, described by Dr. F. Dixey, C.M.G., O.B.E., in 1937 (*Bulletin* 5), but it was only during this last year that these two minerals were identified in them. Now that niobium is comparable in price to tin, and as monazite is not now available from India and Brazil, these occurrences merit further examination. But the pyrochlore and the monazite have exceptionally low radioactivity. The latter mineral has virtually no thorium content, so that its only possible interest is as a source of cerium metals.

During 1950 the Tambani corundum workings were reopened on a small scale by a local resident, who bags corundum won by Africans fossicking. Though the output is small, the wages earned are welcome to the inhabitants of this remote area. The output for 1950 was 184 tons.

There are widespread occurrences of graphite in the Dowa district, but the exposures cover only a very small proportion of the area. From experience in water supply work, it is known that fresh graphite rocks can be recognized by their low resistivity, but it is considered that a geophysical survey on these lines would not be advisable until air photos and new air survey maps are available and systematic geological mapping has been done.

Use of Radioactive Isotopes in Industry

The use of radioactive isotopes in the solution of scientific problems is not, broadly speaking, new. As early as 1913 the application of a radioactive technique to the study of solubilities had been recorded. Its use, however, was strictly limited, due to the fact that only naturally radioactive elements were available and these only in limited quantity at a prohibitive cost. The scope did not appear to be extensive and indeed interest in radioactivity was already waning when in 1934 it was shown by Curie and Joliot that artificial radioactive elements could be produced. This gave a fresh impetus to study in this field and a large number of such elements were made, many in the linear accelerator and the cyclotron. More important perhaps from the practical point of view, was the discovery in the same year of the Fermi effect by means of which, provided one could obtain, say, old radon tubes and a little beryllium powder, a large number of artificial radioactive elements could be obtained by neutron bombardment. Within the last few years even this has not been necessary since, with the commencement of the operation of an atomic pile in this country, a wide variety of radioactive isotopes have become readily available at a reasonable cost.

The principle of the method is to add a minute amount of a radioactive tracer element to the material under investigation and to follow its course by means of the emitted radiation using, for example, a Geiger-Müller counter. If a chemical reaction is being followed, then the radioactive material added will normally be an isotope of the element in which one is interested; whatever happens to the inactive element will also happen to the active isotope. A physical process may be followed in an exactly similar manner as we shall see later.

The technique may be applied to a wide range of research problems and also, in the widest sense, to process control in industrial plants. The type of detecting apparatus used in the various fields of operation depends upon the isotope which is being used and on the type of emitted radiation. Artificial radioactive isotopes are usually β and, or γ emitters and some indeed are very weak β emitters. The Geiger-Müller counter, the electroscope and the photographic plate all find their appropriate use and the various detectors need not be detailed here.

In some cases it is necessary to measure continuously the activity of a flowing liquid and for this purpose a number of different techniques are available. For example, if a soft β emission is to be measured, a shallow zig-zag channel may be cut in a block of perspex. This may then be sealed over with a thin window of distrene of the order of 2 mg. per cm.^{2} and a standard bell jar type of counter applied. Other techniques, in general, require special counters and for the details of the operation and use of Geiger-Müller counters and of the possible errors to be encountered, readers are referred to the work of Maddock[1] and Kohman.[2] It is not proposed here to give examples of the academic use of radio-isotopes although these are numerous and important. Instead, examples will be confined to those industrial uses most likely to be of practical interest to our readers.

RADIOACTIVE TRACERS IN FLOTATION

A considerable number of flotation studies have been carried out using this technique and in view of the difference of opinion as to the mechanism of the collector coating of mineral particles, this field would appear to be a promising one. Carbon 14 for use as a tracer is fairly readily available and lends itself to any flotation studies involving carbon containing compounds. It has already found use in an investigation of the interaction of dodecylamine and quartz by Gaudin and co-workers.[3] Simard and co-workers[4] have studied the depressant action of phosphate on the flotation of galena. They measured the sorption of radioactive dibasic sodium phosphate by ground galena from an aqueous solution at pH 7.8. It was found that sorption was rapid for a period of 10-12 mins., but after this it depended upon the access of air and could continue slowly for several hours.

In the case of leached galena, the amount sorbed corresponded with a monolayer, but for unleached galena it corresponded to a number of layers indicating a conversion to lead phosphate. When both phosphate and dithiophosphate ions were present, each reduced the sorption of the other. In one case the galena showed three area types, one exclusively available to the phosphate ion, one to the dithiophosphate and one equally available to both. The authors conclude that the phosphate ion depresses flotation with dithiophosphate as a collector, both by competitive displacement and because of its hydrophilic character. If the galena has been previously leached then the effect is reduced. This investigation gives a fair indication of the type of work that can be carried out in this field and a great deal of information not readily deduced by other methods may thus be obtained.

USE IN METALLURGY

Radioactive isotopes have been applied to the solution of many problems in smelting, refining and the corrosion of metals, a few examples of which will be enumerated here. Philbrook and co-workers[5] have studied the distribution of calcium between iron and molten slags. A pure armco iron was melted in a graphite crucible, so saturating it with carbon, and a calcium alumino-silicate slag such as would be obtained in the blast furnace, was added. The slag contained radio-calcium and, after cooling, the iron was examined for radioactivity. It was concluded that the amount of calcium taken up from the slag was less than 6×10^{-5} per cent.

Cobalt 60 has been used by Voice[6] in the determination of burden transit times in the blast furnace. A small pellet of active cobalt is placed in a lump of ore and the first appearance of activity noted using the normal casting schedule. Additions are then made at successively shorter times prior to the cast and by this means the transit time can be determined to within 20 minutes or less.

The same worker[7] has also used radioactive indicators to measure blast furnace refractory wear. For this purpose the isotopes used must be strong emitters and have a half life period of some five years. A pellet of the indicator is inserted in the refractory at a known depth when relining. When wear has occurred down to this point the radioactive isotope is liberated, the activity as detected through the walls ceases and appears in the cast. Either indication may be employed and it is obvious that the method may also be used for any continuously operated furnace in which wear cannot otherwise be readily determined.

The source of sulphur in steel has also been investigated.[8] A small amount of iron pyrites containing radioactive sulphur was mixed in with a normal coke oven charge. When coking was completed, it was found that the proportion of active sulphur in the coke was the same as in the coal. In other words the organic sulphur and pyritic sulphur contribute equally to the sulphur content of the coke and thence to the steel. It is therefore the total sulphur content which is important and there is no special virtue in using coal with a low pyrites content.

FRICTION, WEAR AND METAL DEPOSITION

Many problems relating to friction and wear have been investigated using a radioactive tracer technique. Burwell and Strang[9] of the Massachusetts Institute of Technology investigated wear by making one of the rubbing surfaces

radioactive, subsequently examining the other surface for activity using a Geiger counter or X-ray film. They carried out a series of experiments using cast iron, carburized steels and hard chromium plated steels, both with and without lubrication. It was found that although hardness improves wear resistance where similar metals are in contact, when the metals are dissimilar the actual composition is of more importance.

Pinotti and co-workers,[10] employing a similar approach, investigated engine wear using radioactive cast iron piston rings. The rate of wear in this case, however, was measured by determining the change in activity of the oil. It was found that the rate of wear was very high to begin with, but became constant after about two hours. The use of high grade oil considerably reduced the amount of wear, whilst the presence of sulphur in the oil increased it, the increase being proportional to the sulphur content.

Isotopes have been used to study problems in the electroplating industry. Kronsbein[11] has investigated current and metal distribution for copper from the conventional acid-sulphate electrolyte. A small amount of radioactive copper sulphate was added to the electrolyte and the thickness of the copper deposited over the cathode determined by measurement of the activity. Deposition on cathodes of varying shapes was investigated and it was found that the method offered a means of accurate control of the thickness of plating.

APPLICATION TO THE PETROLEUM INDUSTRY

The use of radioactive markers in oil well drilling was described as long ago as 1947 by Doll and Schwede.[12] Markers are placed at various depths in the wall of the borehole to mark, say, a given geological formation or casing collars in a cased well. This enables tools to be accurately positioned and at the time of publication of the paper by these authors such markers had been in use for two years operating under quite adverse conditions of temperature and pressure.

Another interesting application is to be found in the "Gagetron" which is an instrument for the measurement of liquid levels inside tanks, reaction vessels, etc. A minute quantity of radioactive material is placed inside a float riding between guides. The radiation is detected by a Geiger-Müller counter and the position of the liquid level thereby obtained.

Radioactive tracers have been used in the design of distillation columns by Maloney and co-workers.[13] Tests on stills were carried out using methanol and ethanol-water mixtures containing carbon 14. Work is now being carried out on the distillation of multi-component systems using the methods already devised.

CONCLUSION

It will be seen from this rapid survey that the use of radioactive isotopes offers a new approach to the study of difficult problems in many industries. It is difficult to imagine any field, either practical or academic, where their use will not provide another valuable method of investigation. Provided that they are used with due care, radioactive isotopes are not too dangerous to handle and their ultimate disposal does not present any really serious problems.

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The Dosco Miner

Mr. I. G. E. Leek, Chief Mechanization Engineer of the National Coal Board, and Mr. H. Bennett, Mine Development Engineer of Area No. 7, East Midlands Division, recently journeyed to Nova Scotia to investigate the encouraging first reports of a new Canadian coal winning machine for use on longwall faces. The following article, adapted from Mr. Leek's report in *Coal*, gives an interesting preview of the Dosco Miner, which will soon be on trial in a British mine.

Although coalmining operations in the eastern part of Canada are confined to the peninsular Maritime Province of Nova Scotia, in many respects the mining conditions bear a similarity to those existing in Britain. The seams worked on the Nova Scotia fields vary in thickness from 2½ to 6 ft., although some are thicker, and there is little level coal since all the seams dip under the sea with gradients of 1 in 4 common. There is considerable faulting, and roof conditions appear to be similar to those of coalmines of Great Britain.

Some time ago, the Dominion Steel and Coal Corporation, which owns most of the mines in the Nova Scotia area, decided after unsuccessful experiments with American machines and methods, that the British or Continental longwall system was better suited to most parts of the coalfield than the American room and pillar system. As a product of this decision, every type of longwall power loading equipment then in use throughout the world was reviewed. The resultant realization being that no single equipment could be considered as the most effective for the conditions existing in Nova Scotia mines.

Detailed considerations showed that the Meco-Moore cutter loader was limited in scope by the gradients of the seams, while the hardness of the coal deposits themselves made ploughs and scraper boxes unsuitable.

A CONTINUOUS MINER EVOLVED

Some features of the Joy Continuous Loader impressed the Corporation's production officials, however, and it was decided to adapt these features to a new machine for use on longwall faces. The Joy Continuous Miner is a caterpillar-mounted machine designed to operate in seams varying between 42 in. and 96 in. in thickness. The machine consists fundamentally of two main equipments, the cutting and loading head, and the conveyor which gathers and discharges the hewn coal. The head is 30 in. wide and embodies five standard cutting chains which run at a speed of 200 ft./min. and operate in the vertical plane. The head is capable of 64 in. of vertical movement, while in addition it is able to swing horizontally through 16 ft. and thrust 18 in. into the coal while the main chassis of the machine remains stationary. All movements are hydraulically controlled. The short intermediate conveyor immediately behind the cutting chains delivers the coal into a hopper from which a discharge conveyor, capable of being swung to left or right through an angle of 90 deg., delivers it to the gathering haulage.

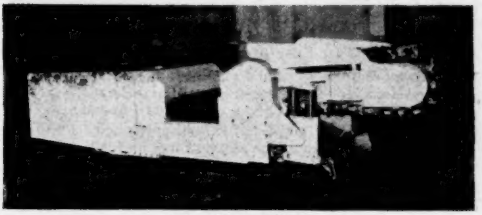
From this basic consideration the Dosco Continuous Miner was evolved after years of experiment and with the help of American and British mining engineers and firms.

The main body of the Dosco is propelled on two large and wide caterpillar tracks, and while the machine weighs 19 tons, pressure through these tracks to the floor is said to be only 20 lb. per sq. in. Consequently a soft floor should not be considered as too serious a handicap. Inside the main body are two motors to drive the cutting chains as well as a smaller motor and all the hydraulic gear it operates.

A MAIN DIFFICULTY

In the getting and conveying portion of the machine's overall equipment, the coal getting head contains seven chains similar to the standard type of cutting chains but following a curved path. At the forefront, where the chain bites into the coal, their total width is 58 in. This dimension gives a 5 ft. advance per cut, the remaining 2 in. falling off at the conveyor side of the cut. At the rear end of the machine, however, it is necessary to "throat" the chains so that they may pass the two gear boxes which drive them. The width here is only 38 in.

This was one of the main difficulties facing the Company's officials. It was eventually solved, in co-operation with the British company Austin Hoy. This firm produced a cutter chain with ball and socket joints between the pick



The Dosco Miner

boxes, similar to those used with curved or hinged jibs. The cutting head can be manoeuvred into two directions by hydraulic jacks and can be pushed forward straight into the coal face to take a cutting of 18 in. while the main body of the machine remains stationary. Other jacks are then operated to raise the cutting head through the seam to the roof.

While this operation is in progress, the cutter chains are revolving and are removing seam coal to a short transverse conveyor. This in turn delivers onto a face conveyor running alongside the machine. In the full cycle of operation, the machine is advanced to the face with jib lowered. The jib is sumped in, raised to the roof, withdrawn and lowered, and subsequently the whole machine is advanced once more to the face for a recommencement of the cycle.

The cycle takes 33 seconds to complete under normal conditions, and gives an output of 2½ tons per minute in a 5 ft. seam. Under good organization, it is said that the rate of advance should never be less than 1 ft. per min. In six hours' work at the coalface a minimum of 350 tons per shift can be expected from the Dosco. Rate of advance may reach 2 ft. per min. and under favourable circumstances a shift tonnage of 700 can be achieved.

SOME ADVANTAGES

In its operational motion from one end of a longwall face to another, the machine takes a 5 ft. web of coal on the buttock. The thinnest seam it can work is 4 ft. 9 in., but it is considered possible that a British version can be made to operate in seams of 3 ft. 6 in. and upwards. Even in its present form it is possible to use the Dosco in British pits where, over recent years, nearly 30 per cent of output has been won from seams of 5 ft. and increasing thickness.

The Dosco has several advantages over other types of longwall loaders used in Britain. It is not dependent on the coal parting well from either roof or floor; there can be no trouble with sticky tops and no need to fire pop shots. In addition, the cleat and nature of the coal should not seriously affect the operation of the machine and there is no question of large fragmentation being produced which either machine or conveyor system could not accommodate. The machine will be turned at each end of the face and will cut its own stable holes. Shotfiring in the coal will be eliminated.

The machine is not considered, however, as an immediate answer to Britain's mining problems. It will soon be on trial in a British mine, but there are problems of application which only experimentation will show best how to solve. The difficulties will scarcely prove unsurmountable.

THE MACHINE IN PRECIS

The particular demands of Nova Scotian conditions emphasize that any coal winning machine must be possessed of six basic requirements for efficient working on the fields. It must be able to cut and deliver coal in quantity and of conveniently small fragmentary dimensions. It must be easily manoeuvrable and suitable for longwall mining operations the while not interfering with timbers already set. It is called upon to cut its own stable and to work on reasonably heavy gradients.

Reports from Canada itself state that the Dosco is working against a 500 ft. wall in the Harbour seam of Dominion No. 18 Colliery. Existing conditions show a face gradient of 17½ deg., and at this face the record run to date has been a cut of 400 tons, achieved during a run of 350 ft. in 6½ hours cutting. Overall figures show a peak production figure of approximately eight tons per minute.

Report of the Tin Research Institute 1951

The report for 1951 of the Tin Research Institute, Greenford, Middlesex, states that advantage was taken of the new laboratory extensions (see *The Mining Journal*, June 8, 1951) to begin several lines of investigation for which the Institute had not previously had facilities—notably the testing of alloys in actual bearings and the casting of bronze in long bars. Chief interest has, however, centred on pilot stage work on electrodeposited tin-alloy coatings.

The new tin-nickel alloy coating process invented in the previous year (see *The Mining Journal*, June 8, 1951, and January 11, 1952) was given publicity by technical papers presented at the Annual Conference of the Electrodepositors' Technical Society at Torquay, and at the International Metal Congress at Detroit. On its own merits the coating has received a very favourable reception, but the current shortage of nickel, for which it is an attractive alternative, has created demands for its immediate adoption on a large scale. The process of developing a satisfactory commercial process from this laboratory work has gone forward rapidly during the year and a pilot-scale plant has been in continuous operation in the Institute's laboratories. A large commercial installation of about 2,000 gallons capacity has been in operation in the Birmingham area for the latter half of the year and a second commercial plant is under construction in Lancashire. In America, too, the first commercial plant is already in use and a number of experimental baths have been installed to test the process.

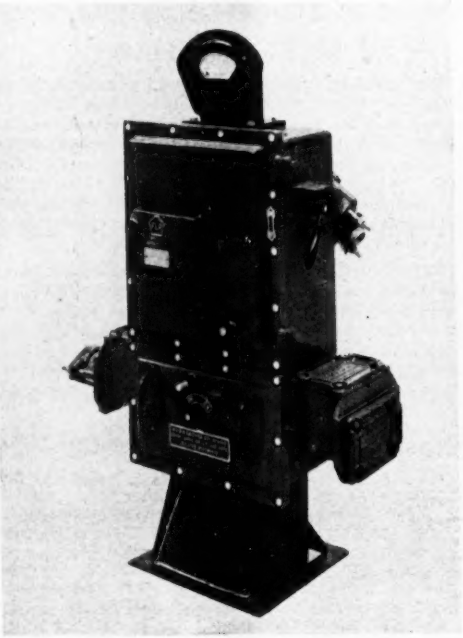
The report also states that contacts with tinplate manufacturers and with the hot-tinning industries on the European continent were extended materially and some very useful technical service was carried through.

MACHINERY AND EQUIPMENT

New Belmos Air Break Distribution Unit

The Belmos Co., Ltd. announces that as a result of recent developments the breaking capacity of their Type S.B.A. Mining Circuit Breaker Unit has been raised to 7.5 MVA. The improved short circuit rating is covered by A.S.T.A. Certificate, tests to ascertain the new rating having been conducted in accordance with B.S.S.936—1940 and A.S.T.A. Publication No. 7. These tests were conducted at 600 V., the symmetrical breaking capacity being 7.25 kA. and peak making capacity 14.5 kA.

The S.B.A. Unit is a development of the Type P.A. Unit, well-known to colliery engineers for many years and, in addition to the increase in fault capacity, the current rating of the unit has been raised to 200 ampères.



The Belmos 200 ampère flameproof air break distribution unit

It is the company's policy to incorporate, as far as possible, improvements in design without radical physical alterations so that they can be made in earlier designs already in service, and it is interesting to note that the increased performance of the S.B.A. Unit has been achieved without major structural change to the enclosure originally Buxton tested in 1935.

The Circuit Breaker is described as a fully free handle, hand-operated unit with over current protection and fully interlocked isolating switch incorporated as standard. Additional optional features include under-voltage and earth fault protection, reversing isolating switch, ammeter and voltmeter. The unit has also been Buxton tested for Group 2 applications.

New West German Dust Counter

A new dust-counter may help West German miners to fight silicosis, according to the Dortmund Mining Office. The counter, called the Tyllandoskop, has been developed by the Ernest Leitz optical works at Wetzlar, working with the Silicosis Research Institute of the Miners' Association at Bochum.

The Holman Pneumatic Scaling Hammers

The manufacturers of the Holman Pneumatic Scaling Hammers, Holman Bros., Ltd., claim that with one of them, a man is able to do as much work as several using hand tools when removing rust or old paint from iron or steel structures, etc., or scale from boilers. These hammers are of the valveless type with only one moving part—the piston—and their makers state that the application of hard metal tips to scaling hammer pistons was the result of considerable research in the development of tungsten carbide tipped tools for percussive machines; a principle which ensures for the striking face a life comparable with that of the piston itself.

The piston strikes blows which, whilst being extremely rapid, are so light that there is no risk of damaging the surface being scaled.

The Scalers will work satisfactorily at any pressure between 60 lb. and 100 lb. per sq. in. There are three sizes: No. 4 is a single piston machine which is normally supplied with a cruciform head; No. 3 is a smaller version of the No. 4; and No. 5 is especially designed for dealing with large surfaces and is a triple headed machine with three pistons in one casing.

The British Jeffrey-Diamond Granulator

The B J-D Swing Hammer Granulator is presented by the manufacturers as an effective unit for the reduction of hard materials to a cubical product. The result is said to return a minimum of fines and oversize.

The Swing Hammer Granulator is manufactured in four sizes. The 15 in. by 8 in. machine has a net weight of 1,220 lb., a gross weight of 1,500 lb., and a case size of 24 cu. ft. It has an approximate r.p.m. of 600 to 1,500, an approximate maximum feed of 3 in., and an approximate maximum horsepower of 10.

Other granulators of the type grade up from these dimensions through the 20 in. by 12 in. model, the 24 in. by 20 in., to the largest of the series, the 36 in. by 24in. This latter has an approximate r.p.m. of 300 to 700, an approximate maximum feed of 10 in., and an approximate maximum horsepower of 100. Its gross weight is 14,200 lb. and its case size 320 cu. ft.

In folder 1450B the manufacturers point out the applications of this machine, many of which serve the mining industry.

Truck Haulage at Adirondack Iron Ore Mine

How the cost of hauling iron ore was reduced by as much as 8c. per ton through the careful use of specially designed heavy-duty trucks at an open-pit iron mine in the Adirondack Mountains of New York is described in U.S. Bureau of Mines *Information Circular* 7629, "Truck Haulage at an Iron Mine in the Adirondack Mountains, New York," by Robert S. Sanford.

The report—one of a series discussing new practices in truck haulage of ore and waste studied by the Bureau—states that among the major factors contributing to efficient low-cost truck haulage are: good trucks, correctly designed for heavy loads and for the impact of loading with power shovels; good maintenance and an efficient repair shop; good roads adequately maintained and careful, well-trained drivers. Heavy-duty trucks are replacing rail haulage in many open-cut mines and even in a few underground mines. The iron mine discussed in this report transports ore by truck to a centrally located crushing plant within one of the open cuts. Conveyor belts move the ore from that plant to the concentrator.

In addition to illustrations, performance charts and cost statistics, the report contains specifications of trucks, the engines, brakes, body, steering, and drive axles, and furnishes data on wage rates, mechanic man-hours per truck, and truck maintenance frequency. (For an item on the evolution of heavy duty trucks on the Mesabi Range, see *The Mining Journal*, March 14, 1952.)

METALS, MINERALS AND ALLOYS

After being on strike for two days, the steel workers in the U.S. have returned to work; in some instances, however, the break in production will cause a longer shut-down. A number of employers want to have a guarantee against further walk-outs before admitting the men back.

The negotiations between the two sides of the industry, which followed the official end of the strike, appeared to be going very favourably until it became known that the Supreme Court had ruled to prohibit the Government from raising wages in the steel mills without the industry's approval. At this point, the steel companies not unnaturally lost interest in the negotiations, and these were eventually broken off. The first hearing by the Supreme Court of the Administration's appeal against last week's ruling in the Federal Court that their steel seizure was illegal has been fixed for May 12. It seems unlikely that any further important developments in the dispute will occur before then.

Market circles in New York now appear to feel that, aside from copper, the country's position as regards non-ferrous metals is heading for a surplus. Latest estimates suggest that available lead may be as much as 100,000 to 150,000 tons in excess of consumer's requirements this year and the zinc surplus may be equally large. The removal of controls, other than price controls, are expected at an early date on lead, bismuth, antimony, cadmium and possibly zinc.

COPPER.—Chief news is the formal abrogation of the agreement between the Chilean Government and the American mining companies. This agreement, signed in 1951, provided that Chile should receive a three-cent increase to 27½c. per lb. in the price of copper for 80 per cent of total production: and for Chile to be free to sell the remaining 20 per cent on the free market. Recently, there appears to have been difficulty in selling this marginal 20 per cent at the price Chile wanted. As reported here last week, the president of the Central Bank of Chile stated that not a single ton of this unallocated copper had been sold since January. By abrogating the agreement, the Chilean Government is free to fix a new selling price for the copper sent to the U.S. and can change the 20 per cent quota. In order to tighten its control of copper, the government has assumed control over all copper exports. As a consequence, 7,000 tons of copper which was about to be shipped, has been stopped.

The Chilean Government claims to have taken this action to provide the country with the necessary amount of dollars for its commercial dealings and to be able to adjust the wages of the copper workers, thereby ending the present strike. The copper companies have destroyed the second of these excuses by offering an increase of 25 per cent in wages, provided that the companies can exchange their dollars at the free market rate. It was reported at the end of last year that agreement had been reached, whereby the companies could sell their dollars freely, but evidently this agreement has not been implemented.

There must be a great deal of doubt whether the Chilean Government will be able to sell much of its output at a price much above the 27.50c. per lb. written into the now-abrogated contract. The government's inability to sell its free quota makes it extremely doubtful whether it will be any more successful now that a larger quantity is involved. Theoretically, of course, if Chile sells the whole of her output at, say, 28.50c. per lb., she would obtain the same revenue as if she sold 80 per cent at 27.50c. and the remainder at 32.50c. per lb. But it would be improbable that she would receive any more dollars, which is part of the avowed aim. Any success immediately encountered could be short-lived as it would be based on a tightness which would be the direct result of the strike. Once supplies were moving freely again, higher prices would tend to disappear.

Meanwhile, prospects are brighter for a settlement, albeit temporary, of the strike dispute. The strikers are willing to return to work provided that the provisions of the labour code forbidding a re-commencement of a strike, are suspended.

N.P.A. officials have issued a warning that if the copper strike in Chile continues for a month, copper allocations to domestic brass mills, wire mills and foundries might have to be sharply reduced. Certain members of the brass mill industry advisory committee are concerned that substitution of other metals, notably aluminium, for copper might form lasting habits.

The wild cat strike which has closed the A. S. & R.'s Smelter at Garfield on April 26, ended on May 1.

The initialing of an agreement between the government of Israel and a Belgian company confirms the earlier rumours that Belgian interests were wanting to develop the copper deposits in the Negev.

LEAD.—Market expectations that the Ministry of Materials would be forced to reduce the price of lead still further were soon realized on this occasion, although the drop to £155 reported last week had long been anticipated. The new price is £147 per ton delivered. Even this price is above the U.S. price. American Smelting & Refining initiated a second price cut in the U.S. bringing the custom smelters new price to 17c. per lb. New York. These cuts are in part the result of a slow consumer demand. This, in turn, was caused partly by the expectation of a price reduction.

The dramatic nature of the cuts was probably intended to convince consumers that there would be no further price cuts. Critics have not been slow to point out that at the present level, the import duty would have to be re-introduced.

While the U.S. price has been falling, the Mexican price has been hardening. The latest quotation to reach us is 18.26c. (U.S.) per lb., f.o.b. Monterey, against 18.23c. a week earlier and 18.08c. three weeks before.

Though the London lead market is not to be re-opened in the immediate future, the door has not been shut. The Chancellor of the Duchy of Lancaster making this announcement said that it remained the purpose of the government to restore lead dealings to the Metal Exchange when the balance of payments position allowed. The matter, according to the official notice, will be reviewed again after the end of June.

TIN.—Another week has passed without news from the negotiators who are trying to reach a tin agreement between Bolivia and the U.S. Meanwhile, the Bolivian Minister of Petrol and Mines has reaffirmed the new government's intention to nationalize the mines, railways and "unproductive estates."

Exports of tin from Malaya during April were very large. At 7,093 tons, they were the highest since November, 1950, and were much bigger than the 5,239 tons of last March. Shipments of 3,365 tons to the U.S. accounted for a large proportion of total exports. The U.K. took the next largest slice, 1,643 tons, and the rest of Europe took 1,265 tons.

N.P.A. states that tin supplies will be adequate to meet allocation requirements in the third quarter of 1952. An extra 10,000 tons would be needed, however, in the fourth quarter of the year.

There are reports that if no agreement is reached with Bolivia for tin concentrates, the U.K. may make another 10,000 tons available.

Production of the Longhorn smelter in April was 1,800 l.tons, the same figure as for the two preceding months. The total for the first four months of the year, 7,202 tons, is much smaller than the total of 12,401 tons for the corresponding period of 1951.

ZINC.—The International Materials Conference has made a supplementary allocation of 8,500 tonnes of zinc for the second quarter of 1952. While no official statement has been made concerning the division of this additional amount, it is believed that the U.K. and the U.S. will each receive an additional 2,000 tonnes. Under the original allocation for the second quarter, the U.S. was to receive 235,800 tonnes and the U.K. 67,000 tonnes.

ALUMINIUM.—The production of aluminium in the U.S. continues to expand steadily. During March production of primary aluminium amounted to 77,069 s.tons. This brings the total for the first quarter of the year up to 226,377 s.tons against 200,716 s.tons. New York reports state that supplies of aluminium in the U.S. are now more than adequate to meet permissible demand. No free market virgin aluminium is reported to have been brought into the U.S. recently.

ANTIMONY.—Prominent dealers in the U.S. antimony market are expecting another cut in the price of antimony. Last week the price quoted by National Lead fell by 6c. to 44c. per lb., in bulk, f.o.b. Laredo, because of increasing competition from imported antimony. The spot price of the imported metal is only 38c. per lb., duty paid, and even at that level buyers are holding off in anticipation of a further slide. The U.S. stockpile programme is scheduled for completion this summer and this, in turn, will lead to more weakness in the market.

SILVER.—The London price declined this week by 1d. to 76d. per oz. The New York price also declined by 1c. to 87c.

The London Metal Market

(From Our Metal Exchange Correspondent)

With the tin market remaining featureless, talk has concentrated on the developments in the lead and copper markets.

The American price for lead was decreased a further 1c. at the end of last week, and it is felt that consumers have been driven back still more upon their stocks in the expectation that a further price fall is inevitable, and it appears from producers own announcements that they have little hope of maintaining the present quotation. On Tuesday morning it was announced by the British Ministry of Materials that H.M. Government could not permit the re-opening of the lead market in London, but promised to review the situation after the end of June. This shows pretty clearly that the main obstacle to re-opening the market is the question of loss of foreign exchange, although in the opinion of the market itself this risk is of a very minor nature when compared with the almost certain fall in price and additional invisible earnings to this country resulting from the operation of the market.

The main event in the copper market has been the suspension by the Chileans of their agreement with the U.S., and it is generally felt that this action will lead to a very much lower price on the free market, and that eventually the U.S. ceiling price will become a world price for a period.

The zinc market is featureless with prices showing signs of receding owing to complete lack of buyer interest.

On Thursday the official close on the tin market was: Settlement price £965, Cash Buyers £964, Sellers £965 10s. Three months' Buyers £963, Sellers £963 10s. In the afternoon the market was slightly higher. Turnover for the day was 65 tons. Approximate turnover for the week was 495 tons.

The Eastern price on Thursday morning was equivalent to £974 15s. per ton, c.i.f. Europe.

Iron and Steel

British interests are deeply involved in the attainment of a speedy settlement of the American steel dispute. There have been repeated warnings that large scale shipments of U.S. steel to British ports must not be expected until the second half of the year, but an examination of the Board of Trade returns for March reveals that in that month the U.K. received more steel from America than from any other source and further shipments are still coming to hand. Substantially increased tonnages are also coming in from Belgium, Luxembourg and Western Germany and the total iron and steel imports in March reached 145,000 tons compared with only 54,000 tons in March, 1951.

The supply position is thus distinctly easier with the result that certain engineering firms engaged on essential production have been granted increased allocations. This concession of course is limited in its scope. The majority of steel users, not excluding the shipbuilding industry are still severely rationed, extra supplies being reserved for firms engaged on re-armament work or export orders.

The flow of scrap to the steel works and foundries is still very disappointing and all the big consuming plants are in dire need of additional tonnages.

On the other hand ore supplies are now abundant. Imports are running at the rate of about 1,500,000 tons per annum above last year's figures and the output of home ore is now the highest since 1943. Thus it would appear that provision of more coke is now the only obstacle to be oxercome before adidtional blast furnace capacity is brought into operation.

Export demand for British steel is very heavy, overseas buyers being alert to the fact that British steel prices are well below the quotations of American and European producers.

MAY 8 PRICES

COPPER

Electrolytic ... ... £231 0 0 d/d

TIN

(See our London Metal Exchange report for Thursday's prices)

LEAD

Soft foreign, duty paid ... ... £147 0 0 d/d
Soft empire, including secondary lead ... £147 0 0 d/d
English lead ... ... £148 10 0 d/d

ZINC

G.O.B. spelter, foreign, duty paid ... £190 0 0 d/d
G.O.B. spelter, domestic... ... ... £190 0 0 d/d
Electrolytic and refined zinc ... ... £194 0 0 d/d

ANTIMONY

English (99%) delivered, 10 cwt. and over ... ... £305 per ton
Crude (70%) ... ... £260 per ton
Ore (60% basis) ... ... 37s. 6d./40s. nom. per unit, c.i.f.

NICKEL

99.5% (home trade) ... ... £454 per ton

OTHER METALS

Aluminium, £154 per ton.
Bismuth, 25s. lb.
Cadmium, 18s. 3d. lb.
Chromium, 6s. 5d. lb.
Cobalt, 20s. lb.
Gold, 248s. f.oz.
Iridium, £65 oz. nom.
Magnesium, 2s. 10½d. lb.
Osmiridium, £35 oz. nom.
Osmium, £70 oz. nom.
Palladium, £8 10s. oz.
Platinum (scrap), £33.
Platinum, £27/33 5s. nom.
Rhodium, £45 oz.
Ruthenium, £30 oz.
Quicksilver, £73 ex-warehouse.
Selenium, 25s. nom. per lb.
Silver (bar), 76d. f.oz. spot and forward.
Tellurium, 19s. lb.

ORES, ALLOYS, ETC.

Bismuth ... ... 65% 11s. 6d. lb. c.i.f.
60% 11s. lb. c.i.f.
Chrome Ore—
Rhodesian Metallurgical (lumpy) £13 per ton c.i.f.
" " (concentrates) £13 per ton c.i.f.
" " Refractory £12 12s. per ton c.i.f.
Baluchistan Metallurgical ... £14 16s. per ton c.i.f.
Magnesite, ground calcined ... £26 - £27 d/d
Magnesite, Raw ... ... £10 - £11 d/d
Molybdenite (85% basis) ... 103s. 1½d. per unit c.i.f.
Wolfram (65%), U.K. ... 485s. nom. c.i.f.
Tungsten Metal Powder (for steel manufacture) ... 35s. nom. per lb. (home)
Ferro-tungsten ... ... 33s. nom. per lb. (home)
Carbide, 4-cwt. lots ... ... £30 3s. 9d. d/d per ton
Ferro-manganese, home ... £43 15s. 2d. per ton
Brass Wire ... ... 2s. 8¼d. per lb. basis.
Brass Tubes, solid drawn ... 2s. 1¼d. per lb. basis.

U.K. METAL & MINERAL IMPORTS—MAR.

	Units	*Mar. 1952*	*Jan.-Mar. 1951*	*Jan.-Mar. 1952*	*Increase or decrease in 1952 over 1951*
Non-ferrous metals and manufactures:					
Aluminium and alloys...	Cwt.	300,488	471,433	881,287	+409,854
Bismuth*	Lb.	97,759	180,154	156,892	− 23,262
Cadmium	Lb.	242,304	316,103	522,640	+206,537
Cobalt and alloys.....	Lb.	346,319	860,407	809,941	− 50,466
Copper:					
Electrolytic	Tons	16,744	56,972	50,832	− 6,140
Other.....	Tons	18,069	35,779	40,002	+ 4,223
Lead	Tons	14,523	19,671	63,647	+ 43,976
Mercury	Lb.	129,030	220,784	236,525	+ 15,741
Nickel	Cwt.	3,823	25,317	27,826	+ 2,509
Tin	Tons	546	881	1,991	+ 1,110
Zinc	Tons	18,227	26,557	50,305	+ 23,748
Ores and concentrates:					
Antimony ore and conc.	Tons	3,808	5,828	7,406	+ 1,578
Bauxite	Tons	11,164	84,314	65,178	− 19,136
Chromium ore.....	Tons	19,011	28,185	49,223	+ 21,038
Iron pyrites†.....	Tons	29,175	46,895	69,054	+ 22,159
Manganese ore.....	Tons	43,906	97,894	126,093	+ 28,199
Molybdenum ore.....	Cwt.	8,322	13,701	18,574	+ 4,873
Nickel ore, conc. & matte	Tons	2,653	9,332	6,245	− 3,087
Tin ore and conc.....	Tons	5,729	10,704	13,422	+ 2,718
Titanium:					
Ilmenite	Tons	18,335	30,287	32,544	+ 2,257
Other sorts	Tons	184	1,365	2,422	+ 1,057
Tungsten ore	Tons	1,163	914	1,467	+ 553
Zinc ore and conc.	Tons	10,520	30,932	42,550	+ 11,618
Non-metalliferous mining products:					
Asbestos	Tons	7,328	24,236	23,022	− 1,214
Magnesite	Tons	920	5,419	6,291	+ 872
Sulphur.....	Tons	23,868	86,671	107,647	+ 20,976

*Excluding bismuth alloys.
†Including cupreous iron pyrites.

THE MINING MARKETS

(By Our Stock Exchange Correspondent)

The gilt-edged market, which only last week afforded the new British Electricity 4½ per cent Loan a very lukewarm reception, took a sudden turn for the better. Prices showed considerable firmness and the period closed with sharp all round gains. The pound abroad, which has been easing away from its recent peak, also steadied.

Kaffir shares at last turned the corner. Towards the end of the week, producers and developers with few exceptions recorded gains. The market seems to hold the view that the constitutional crisis in the Union has been sufficiently discounted; for the time being at any rate. Dealers on the floor of the House reported no further selling by holders. A trickle of small buyers with ône or two substantial orders followed close on the heels of the initial technical recovery. This change found the market short of stock and prices consequently rebounded.

Far West Rand mines were particularly favoured. The April Rand returns recorded very satisfactory figures for West Driefontein. The company reports a working profit in excess of £50,000 and a considerable reduction in working costs per ton. Some of the older mines, however, were less popular. Their costs generally increased and the continued decline in the price of gold on the free markets makes them much less attractive investments in to-day's circumstances. Readers may recall that on several occasions last year this column advised them of the importance of the free price of gold to these mines.

Consolidated Murchison shares improved on the report showing profits for 1951 at £2,659,051 compared with £558,891. During the 1952 March quarter there was a decrease in production of 1,141 tons from the last quarter of 1951 and the chairman warned shareholders that a material reduction must be expected during 1952. Further consideration of these facts caused the shares to finish below best at around 53s. 6d.

O.F.S. issues were also better in sympathy with the general trend in Rand issues. Both the President mines showed sharp gains in belated recognition of the recent satisfactory results, and the price of President Steyn shares finished the week level with that of President Brand. This former property has reached a more advanced stage of development than the other and it is reasonable to expect the mine to come into production first.

Asbestos shares also rose sharply following the 5 per cent increase in dividend by Cape Asbestos. The company is paying 22½ per cent for the year as against 17½ per cent for 1950. Group trading profit showed an increase of £467,699. The shares at one time rose to 19s. The company is registered in the United Kingdom and will presumably be subject to E.P.L.

Copper shares, while mainly better, reflect market disappointment with the Mufulira dividend of 3s. a share on the increased capital. This company's lower output can be attributed to the coal supply difficulties on the Northern Rhodesian belt. The interim dividends by Roan and R.S.T. were much as expected. Roan declared an interim of 12½ per cent and R.S.T. 15 per cent. Both companies have recently made increases in capital and strict comparison is difficult.

Although figures for Malayan tin exports in April were the highest since November 1950, the shares were friendless. The sharp fall in the price of rubber has upset the equilibrium of this market.

Lead/zinc shares were also all down. A further cut of £8 in the U.K. price of lead to £147 a ton followed a reduction of one cent per lb. by the American Smelting and Refining Company. The free price of lead remains considerably below the official U.K. price.

Dollar stocks generally improved following the firmer tendency in Canada and the United States. Noranda is expanding its interests. The company proposes to enter the oil industry, is constructing a sulphur/iron plant, and is considering participating in the construction of a zinc smelter in Quebec. International Nickel declared a quarterly dividend of 50c. corresponding with 40c. paid last year.

FINANCE	Price May 7	+ or − on week
African & European	2⅛	+ ⅛
Anglo American Corpn.	6⅜	+ ⅛
Anglo-French	19/6	+1/-
Anglo Transvaal Consol.	28/9	
Camp Bird	11/-	
Central Mining (£1 shrs.)	33/9	
Consolidated Goldfields	46/10½	+7½d
Consol. Mines Selection	28/10½	
East Rand Consols	3/3	+3d
General Mining	4½	
H.E. Prop.	32/6	+1/3
Henderson's Transvaal	11/6	+3d
Johnnies	3⅛	− ⅛
Rand Mines	4⅜	
Rand Selection	38/9	+1/3
Union Corporation	8⅜	+ ⅛
Vereeniging Estates	4½	
Writs	30/-	+1/10½
West Wits	43/9	+2/6

RAND GOLD		
Blyvoors	38/9	+6d
Brakpan	18/-	+6d
City Deep	33/9	−7½d
Consol. Main Reef	33/1½	+7½d
Crown	47/6	−7½d
Daggas	3⅛	+ ⅛
Dominion Reefs	2/-	+1½d
Doornfontein	23/6	+1/6
Durban Deep	3½	− ⅛
E. Daggas	21/3	+1/3
E. Geduld ... (4/- units)	41/10½	+7½d
E. Rand Props	3⅛	+ ⅛
Geduld	6½	
Grootvlei	32/6	+7½d
Libanon	12/9	+3d
Luipaards Vlei	18/-	
Marievale	20/3	+9d
Modderfontein B.	5/6	+1½d
Modderfontein East	27/6	−1/3
New Kleinfontein	29/4½	+7½d
New Pioneer	13/-	+1/6
Randfontein	17/6	+3d
Robinson Deep	11/9	
Rose Deep	27/6	
Simmer & Jack	6/-	
Springs	8/-	+4½d
Sub Nigel	2½	+ ⅛
Van Dyk	11/-	+9d
Venterspost	21/3	+1/3
Vlakfontein	17/4½	+4½d
Vogelstruisbult	25/7½	+1/1½
West Driefontein	6	+ ⅛
W. Rand Consolidated	45/-	−7½d
Western Reefs	40/-	+1/10½

O.F.S.		
Alpha F.S.A.	6/3	
Blinkpoort	16/3	+7½d
Central Mining F.S.	3/3	+3d
Freddies	7/6	+1/3
Freddies N.	8/6	+1/-
Freddies S.	8/4½	+1/4½
F.S. Geduld	2⅜	+ ⅛
Geoffries	17/6	+1/3
Harmony	18/9	+1/4½
Lydenburg Estates	9/4½	+7½d
Middle Wits	15/6	+1/-
Ofsits	38/1½	+1/10½
President Brand	16/10½	+2/-
President Steyn	28/10½	+2/7½
St. Helena	17/6	+9d
U.F.S.C. & G.	6/6	+6d
Virginia Deb.	73	
Virginia Ord.	9/10½	+9d
Welkom	28/9	+2/6
Western Holdings (New)	3½	+ ⅛

WEST AFRICAN GOLD		
Amalgamated Banket	1/6	
Ariston	5/6xd	−1½d
Ashanti	18/9	−6d
Bibiani	6/9	−3d
Bremang	2/6	
G.C. Main Reef	3/3	
G.C. Selection Trust	6/1½	−1½d
Konongo	2/4½	−1½d
Kwahu	3/9	−1½d
London & African Mng.	1/6	
Lyndhurst Deep	1/1½	
Marlu	1/4½	−1½d
Nanwa	5d	
Taquah & Abosso	3/10½	−3d

AUSTRALIAN GOLD		
Boulder Perseverance	2/3	−1½d
Gold Mines of Kalgoorlie	9/9	−3d
Great Boulder Prop.	5/8	−3d
Great Western Consol.	6/10½	
Lake View and Star	15/9xd	−3d
Mount Morgan	16/6	+3d
North Kalgurli	13/3	+3d
Paringa	6d	
Sons of Gwalia	10/-	+3d
South Kalgurli	8/4½	
Western Mining	7/4½	−1½d

MISCELLANEOUS GOLD		
Cam and Motor	39/4½	+7½d
Champion Reef	7/-	
Falcon Mines	7/9	
Phoenix	25/3	+3d

MISCELLANEOUS GOLD (contd.)		
G.F. Rhodesian	6/-	−3d
London & Rhodesian	4/9	
Motapa	1/7½	
Mysore	4/-	−3d
New Guinea	1/4½	+1½d
Nundydroog	5/-	−6d
Ooregum	2/9	
Oroville	11/-	
St. John d'El Rey	28/1½	−1/10½
Zams	37/6	−9d

DIAMONDS		
Anglo American Inv.	4⅜	+ ⅛
Casts	33/6	−6d
Cons. Diam. of S.W.A.	4	
De Beers Defd. Bearer	65/8	+1/-
De Beers Pfd. Bearer	14⅜	−⅛

COPPER		
Chartered	55/-	−1/3
Indian Copper	3/7½	
Messina	3⅜	−⅛
Nchanga	6⅜	+⅛
Rhod. Anglo-American	56/6	+1/3
Rhodesian Selection	15/4½	−4½d
Rhokana	20	+½
Rio Tinto	21xd	−½
Roan Antelope	12/1½	+1½d
Selection Trust	40/9	+2/-
Tanks	57/-	+1½d
Tharsis Sulphur Br.	43/9	−1/3

TIN (Eastern)		
Anglo-Burma	2/9	
Ayer Hitam	25/-	−6d
Bangrin	8/9	−7½d
Gopeng	11/6	−7½d
Hongkong	8/-	−3d
Ipoh	22/6	−6d
Kamunting	11/3	−1/-
Kepong Dredging	7/7½	
Kinta Tin Mines	14/6	−3d
Kramat Pulai	4/10½	
Malayan Dredging	23/3	−3d
Pahang	14/6	−7½d
Pengkalen	9/3	−6d
Petaling	14/3xd	−1/-
Rambutan	12/6	
Siamese Tin	21/6	−3d
Southern Kinta	14/6	−9d
S. Malayan	24/6	−3d
S. Tronoh	17/-	
Sungei Kinta	17/6	−7½d
Tekka Taiping	8/9	−3d
Tronoh	24/3	−6d

TIN (Nigerian and Miscellaneous)		
Amalgamated Tin	8/10½	−3d
Beralt Tin	23/3	−3d
Bisichi	3/3	−3d
British Tin Inv.	16/3	−6d
Ex-Lands Nigeria	4/7½	−6d
Geevor Tin	12/6	+1½d
Gold & Base Metal	3/6	−1½d
Jantar Nigeria	5/-	−3d
Jos Tin Area	10/9	−3d
Kaduna Prospectors	4/-	
Kaduna Syndicate	5/3	−1½d
London Tin	5/7½	
Ribon Valley	1/-	
United Tin	2/3	−3d

SILVER, LEAD, ZINC		
Broken Hill South	43/-	−5/9
Burma Mines (3/8 sh.)	1/10½	−3d
Consol. Zinc	25/4½	−10½d
Lake George	15/-xd	−1/3
Mount Isa	35/-	−1/6
New Broken Hill	24/3	
North Broken Hill	58/-xd	−1/3
Rhodesian Broken Hill	15/-	−7½d
San Francisco Mines	32/6xd	−9d
Trepca	3/6	

MISCELLANEOUS		
BASE METALS & COALS		
Amal. Collieries of S.A.	44/4½	+7½d
Associated Manganese	40/-	−1/-
Chinese Engineering	4/-	
C.P. Manganese	51/-	
Natal Navigation	3½	
Wankie	16/-	
Witbank Colliery	2½	

CANADIAN MINES		
Dome	$34	−$⅛
Hudson Bay Mining	$101	+$4
International Nickel	$79½	+$2½
Mining Corpn. of Canada	£5⅞	−£⅛
Noranda	$136	+$1
Quemont	£7½	−£½

OIL		
Anglo-Iranian	5⅜	+ ⅛
Apex	43/1½	−7½d
Attock	23/9	
Burmah	68/9	+7½d
Canadian Eagle Bearer	35/1½	−1/7½
Mexican Eagle	22/6	+6d
Shell	4⅜	+ ⅛
Trinidad Leasehold	39/9	+3d
T.P.D.	29/4½xd	
Ultramar	32/-	−3d

COMPANY NEWS AND VIEWS

Mufulira and Roan Profits Decline in March Quarter

Production of blister copper of Mufulira Copper Mines, during the March quarter fell sharply to 10,249 tons against 22,278 tons in the preceding three months. Of this amount only 9,499 tons were sold against 21,528 tons in the previous three months period, with the result that profits before tax slumped to £767,000 against £2,294,000 in the December quarter.

As previously announced, production during the March quarter was restricted by a coal shortage which was aggravated by the threat of damage to the railway bridge over the Kafue River and while this threat continued, it was necessary to stock part of the coal supplies as reserve for maintaining essential services if the railway connection was severed.

The quarterly report states that as at March 31, last there remained 4,768 tons in concentrate form awaiting smelting and that it is expected that most of this tonnage would be smelted by the end of the financial year. During the first nine months of the current year, profits before tax, but after provisions for replacements and London expenditure, was £5,067,000 against £5,193,000 in the corresponding period of 1950-51.

Mufulira	*December Quarter* (1951)	*March Quarter* (1952)	*9 months to March* (1951)	(1952)
Sales .....l.tons	21,528	9,499	55,243	47,945
	(£000)	(£000)	(£000)	(£000)
Revenue.....	4,379	1,982	9,370	9,795
Costs	1,782	1,147	3,918	4,381
Difference in value of copper stocks.....	Cr.47	Cr.198	Cr.322	Cr.468
Surplus	2,644	1,033	5,774	5,882
London expenses	25	16	56	65
Replacements*	325	250	525	750
Profit before taxation ...	2,294	767	5,193	5,067

*Subject to revision when year's accounts considered.

Sales of blister copper effected by Roan Antelope Copper Mines during the March quarter amounted to 18,185 tons against 21,249 tons and profits before tax totalled £1,809,000 against £2,069,000 in the preceding three months.

During the first nine months of the current year profits aggregated £6,041,000 compared with £4,400,000 in the corresponding period of 1950-51.

Roan Antelope	*December Quarter* (1951)	*March Quarter* (1952)	*9 months to March* (1951)	(1952)
Sales .....l.tons	21,249	18,185	53,921	59,336
	(£000)	(£000)	(£000)	(£000)
Revenue	4,323	3,795	9,316	12,158
Costs.....	1,865	1,672	4,244	5,189
Difference in value of copper stocks	Cr.47	Cr.36	Cr.93	Cr.118
Surplus.....	2,505	2,159	5,165	7,087
London expenses	36	37	90	108
Replacements*.....	400	313	675	938
Profit before taxation ...	2,069	1,809	4,400	6,041

*Subject to revision when year's accounts considered.

Ashanti's Heavy Tax Burden

Operational and financial details for the year ended September 30, 1951 of Ashanti Goldfields Corporation, summarized below, call for little comment. Tonnage throughput was higher, but the yield per ton was lower owing to the exploitation of the relatively low grade deposits from the Corporation's "outside mines," which accounted for about 15 per cent of the tonnage crushed.

Year to Sept. 30	*s.tons Milled*	*Grade* (dwt.)	*Yield* (oz.)	*Costs per ton** s. d.	*Ore Reserves Tons* (000)	*Grade* (dwt.)
1950	218,670	19.0	189,815	70 3	1,616.4	18.5
1951	237,637	17.2	188,339	71 9	1,506.9	18.4

*Including development charges.

Thus output and bullion revenue declined slightly. But taxation liabilities were heavier by as much as £222,000 with the result that the balance available for distribution was some £202,000 lower, and dividend payments were reduced to 2s. per 4s. share on the £1,248,557 issued capital.

Year to Sept. 30	*Bullion Proceeds** £	*Mining Costs* £	*Tax†* £	*Net Profit* £	*Dividend* %	*Retained* £
1950	2,397,148	821,892	729,046	634,561	62.5	205,369
1951	2,359,642	852,857	950,912	432,302	50	104,556

*Less realization charges and after adjustment of opening and closing of bullion stock.
†Including Gold Coast Government Royalty and Gold Duty.

The outlook for the current year is difficult to assess. Costs continue to rise and with the outside mines being brought more and more into the production picture gold output will be difficult to maintain. But on the credit side, the Corporation will have the benefit from the end of April last of the additional revenue from the whole of its output at premium prices, rather than from only 40 per cent of its production as formerly. The new Gold Coast Minerals Duty Bill should result in a saving and the current year's accounts will reflect tax liabilities based on the current year's profit instead of the preceding year's profit as in the case of the accounts for the year under review.

Bibiani's Good Development Results

The report and accounts for the year ended September 30, 1951, for Bibiani (1927) showed that the year's work was wholly satisfactory. The tonnage throughput was the highest in the company's history and the gold production of 74,868 f.oz. improved on the preceding year's figure by 872 oz.

Year to Sept. 30	*s.tons Milled* (000)	*Grade* (dwt.)	*Yield* (oz.)	*Costs per ton* s. d.	*Ore Reserves Tons* (000)	*Grade* (dwt.)
1950	333.4	4.8	73,996	32 7	1,759.8	5.3
1951	352.6	4.6	74,868	35 6	1,764.3	5.4

Indeed, bullion revenue, after adjusting for opening and closing stocks in which £27,144 against £22,103 was carried forward, was slightly higher than in the previous year. But rising costs and heavy tax liabilities cut deeply into the balance available for distribution which at £111,473 was some £55,000 lower than that available in the preceding year. Accordingly, the dividend distribution was reduced to 20.8 per cent against 25 per cent previously.

Year to Sept. 30	*Bullion Proceeds** £	*Mining Costs* £	*Tax†* £	*Net Profit* £	*Dividend* %	*Retained* £
1950	922,311	569,808	141,411	166,648	25	97,898
1951	922,169	625,755	110,639	111,473	20.8	56,785

*Less realization charges and after adjustment of opening and closing of bullion stock.
†Including Gold Coast Government Gold Duty.

One impressive feature of the year's work was the increased development footage recorded which jumped from 20,328 ft. to 28,300 ft. and some excellent disclosures were obtained on the south ore body, on the west reef, below level 12. The development of this ore body has been an important feature of the development work carried out in recent years and in order to maintain adequate reserves for the future, this work will continue to receive a high priority. As a result of the year's development work 174,216 tons were added to the ore reserves averaging 6.73 dwt. per ton.

The company's surface reef outcrop has not yet been proved to its fullest extent and the possibility of it extending to the South is now being examined. Generally speaking, the value of the surface ore averages about 2.6 dwt. per ton but the 92,833 tons sent to the mill during the year under review averaged 3.13 dwt. per ton, which is an improvement over the previous year.

British Guiana's All-Round Improvement

The profit and loss account of British Guiana Consolidated Goldfields covering the 17 months period ended December 31, 1951, shows that bullion proceeds advanced to £175,455 from £73,363 in the year ended July 31, 1950. This was the main item comprising the gross income of £477,554, which compares

with £74,518 in the year to July 31, 1950. The improved results were partly attributable to the yield obtained from the dredge installed on the lower Potaro River in August, 1951, and which during the five months of its operations covered by the reports and accounts, was working in a particularly rich pocket, the yield from its first two months' operations being 4,440 f.oz.

However, after providing for all expenses, and taxation liabilities which absorbed £20,900 equivalent to 55 per cent of the profits, the amount available for distribution was £17,003, which compares with £3,645 in the preceding period. Shareholders participated in the better results receiving 8 per cent (4 per cent) on the £294,628 issued capital in 2s. shares and after appropriating £992 for expenses in connection with the recent capital issue which raised the issued capital to its present amount from £205,371, the balance to be carried forward was £9,807 compared with £6,171.

During the first four months of the current year 404,445 cu. yd. were dredged yielding 3,887 f.oz. equivalent to 4.61 grains of fine gold per cu. yd. These figures will show a small but useful operating profit, Mr. J. Roland Robinson, chairman, stated in his address to shareholders at the annual meeting, and he believed that some of the difficulties experienced during the first four months have now been overcome so that the company can look forward, subject to unseen eventualities, to a reasonable profit being earned during the current year. Extracts of the chairman's statement appears in the next column.

Company Shorts

Rand Mines Lower Dividend Income.—Dividend income of Rand Mines during the calendar year 1951 at £976,537 was lower by £148,546 than in the preceding year, but income from interest in exchange and sundry revenue, showed modest improvements and gross income for the year totalled £1,026,711 compared with £1,167,227. Administration and other expenses totalled £73,748 against £51,352 and the available balance before tax was £949,513 against £1,112,575. Tax liabilities were heavier than in the preceding year, £44,075 against £32,417. The sum of £50,000 (£100,000) was transferred to exploration reserve and £27,261 (£43,077) was allocated to forfeited dividends account.

The dividend distribution totalled 7s. per 5s. share (same) which required £752,848, leaving the carry forward at the fiscal year-end at £1,743,566 against £1,640,937.

During the year the company acquired a substantial holding in Harmony Gold Mining by exercising rights accruing to it as a shareholder in certain other companies and by the acquisition of further rights and shares in the open market.

Mr. W. H. A. Lawrence is chairman. The annual meeting will be held in Johannesburg on May 30.

Lyndhurst-Deep Level's High Grade Ore.—Although Lyndhurst-Deep Level (Gold and Silver) only put 19,170 tons through the mill during the calendar year 1951 compared with 32,995 tons in the preceding year, the average grade was astonishingly high at 19.8 dwt., compared with 7.3 dwt. in 1950, so that gold output was more than maintained, total production amounting to 17,202 oz. against 10,271 oz. previously. Thus bullion proceeds advanced to £197,560 against £127,378. Investment income (gross) and sundry revenue swelled gross revenue to £223,540 against £154,201.

However, the lower tonnage throughput effected working costs which rose to 88s. 10d. per ton compared with 47s. 2d. in the previous year. Additionally, development charges rose to 32s. 11d. per ton milled compared with 23s. 6d. in the previous year with the result that mining expenditure increased £150,509 against £116,623 in 1950. And after providing for all other expenses, including £3,179 (£3,292) for depreciation and £12,865 (£12,188) for taxation, the balance available for distribution amounted to £52,132 compared with £17,762 in 1950. Dividend distribution was stepped up to 15 per cent (5 per cent) which absorbed £34,650 (£11,550) and the carry forward at the fiscal year-end was stronger at £31,189 compared with £13,707 previously.

Mr. Robert Annan is chairman. The annual meeting will be held in London on May 14.

Mr. A. B. D. Fox has been appointed Chairman of Jos Tin Area (Nigeria) and of Lower Bisichi (Nigeria) Tin Mines in succession to **Mr. A. Stanley Williams** who has resigned owing to ill health but will remain a director of both companies.

Dr. F. E. Keep has resigned from the board of Trepca Mines on taking up a permanent position in South Africa and **Mr. R. Walker**, Managing Director of Central Mining and Investment Corporation, has been appointed a director in his place.

BRITISH GUIANA CONSOLIDATED GOLDFIELDS

The Sixteenth Annual General Meeting of British Guiana Consolidated Goldfields Ltd. was held on Monday last at 24, Coleman Street, London, E.C.2.

Mr. J. Roland Robinson, M.P. (Chairman) who presided, in the course of his speech said:—

The profit for the period amounts to £37,903 compared with £9,395 for the year to July 31, 1950. In the current year, however, I think the results will reflect the real capabilities of our undertaking at the present stage of its development.

Unfortunately, the figure I have mentioned is not one which remains available either for the benefit of the shareholders by way of dividend or for ploughing back into the company's resources. A very substantial slice is taken from it by taxation, the total for the period is £20,900, equivalent to 55 per cent of the profits.

Your Board have given most careful consideration to the question of the dividend which they should recommend to you for approval out of the profits earned for the period, and have decided that a reasonable amount would be 8 per cent actual for the period. In this decision they have the approval of the C.D.C. as required by the agreement with that Corporation. Unfortunately, this dividend reaches the shareholders after the deduction of income tax at 9s. 6d. in the £ and the amount required to pay this net dividend is £12,374.

After providing for this dividend, the amount available to be carried forward is £9,807 compared with £6,170 brought in.

The areas in British Guiana over which we hold mining rights have not changed materially during the past year, but we are in process now of converting some of our Exclusive Permissions on the Konawaruk River into Dredging Concessions preparatory to dredging operations in that area as soon as the necessary plant has been purchased and installed on the site.

Our prospecting work continues. Some results have been received, but a detailed analysis has not yet been completed. Although no new dredging areas have yet been proved we have a great deal of information which will help us in the dredging work already planned. In the meantime it is of interest to note that the reserves on the Mahdia which at July 31, 1950, were estimated at 1,222,688 cu. yd. at 3.83 grains per cu. yd., were estimated at December 31, 1951, at 2,138,000 cu. yd. at 3.75 grains per cu. yd. This increase is in spite of the fact that during the intervening period the Waddington dredge had throughput of over 1,000,000 cu. yd. at 3.59 grains per cu. yd. This useful increase in reserves will have the effect of extending the life on the Mahdia which should be a more profitable operation following the overhaul of the dredge.

We were able to keep the Waddington dredge in operation until after the commencement of operations on the Potaro so that at no time were we without production. As you know, the dredge was long overdue for a much needed overhaul. Increasing wear and tear on the dredge caused corresponding increases in operating costs; hence it was taken out of service in October, 1951. I am pleased to say that the overhaul has now been satisfactorily completed, and the dredge started working again towards the end of January of this year.

As you already know, the new dredge on the Lower Potaro finally commenced operations in August, 1951. The new dredge started work in a very rich pocket of ground. It has now exhausted this pocket, and is working in average ground. We have had a number of technical difficulties with regard to the recovery of our gold. Some steps have already been taken to improve the situation, and others are planned. Hence we look forward to improved efficiency and greater production from the dredge than we have had during the past four months.

During the past year your Directors have given much thought to the securing of a further dredge to work on the Konawaruk River. Quotations have been secured for new dredges and for second-hand dredges, and a number of these have been examined. Negotiations are now proceeding to purchase one of them, although agreement has not yet been reached. It is hoped that the negotiations may be finalized within the next two or three months and arrangements concluded for shipping the dredge to British Guiana.

I am now able to give you some figures for the four months to April 30, 1952, the dredging results for April having just been received. The position for the four months is as follows: yardage dredged, 404,445; f.oz. recovered, 3,887; grains of fine gold per cu. yd., 4.61.

These will show a small but useful operating profit and we believe that we have been able to overcome some of the difficulties experienced during the first four months, particularly with the Potaro dredge in recovery of flaky and tarnished gold while working through a rather sandy area, so that we look forward, subject to unforeseen eventualities, to a reasonable profit being earned during the current year.

The report and accounts were adopted.

WELKOM GOLD MINING CO., LTD.

(Incorporated in the Union of South Africa)

COMMENCEMENT OF STOPING OPERATIONS

PROVISION OF TEMPORARY FINANCE

MR. H. F. OPPENHEIMER ON DEVELOPMENT OPERATIONS

The Fifth Annual General Meeting of Welkom Gold Mining Co. Ltd., will be held in Johannesburg on May 23.

The following is an extract from the statement by the chairman, **Mr. H. F. Oppenheimer,** dated April 7, 1952, circulated with the annual report and accounts for the year ended December 31, 1951:—

During October, 1951, the main haulage connecting the two shafts on the 2,750 ft. level was completed and it was possible to begin stoping operations on a limited scale early in November.

The reduction plant was officially opened at the end of November, but metallurgical tests have been carried out prior to that, using ore from development. Since November 1 the tonnage derived from stoping operations has been gradually increased and the stoping width has been decreased, but until more stope faces become available so that the grade can be improved a working loss must be expected. It is expected that the mine will be returning a monthly working profit by the middle of the year.

The policy adopted of starting milling operations before a large ore reserve had been established was only possible because of evidence supplied by the comprehensive surface drilling programme and confirmed by the satisfactory development results obtained.

As shareholders are aware, the reduction plant was purchased from Springs Mines Ltd. at which mine it treated about 69,000 tons of ore a month. The metallurgical tests carried out since its erection at your mine indicate that the plant will have a similar capacity under Orange Free State conditions, and that if it is extended by a unit with a nominal capacity of 25,000 tons a month, a monthly tonnage of almost 100,000 tons can be treated. It was therefore decided to extend the underground development programme so that an ore reserve sufficient for a milling rate of 100,000 tons per month would be built up with reasonable speed, and to charge the costs of development in excess of the amount required for the existing plant to capital expenditure. Later, as the tonnage milled rises, the amount of excess development charged to capital expenditure will be reduced gradually until all development expenditure is included in working costs.

FINANCE

The finances of your company have been assisted materially by revenue from gold produced which up to the end of March had brought in £280,750, of which £202,615 was earned during the period January to March, 1952, inclusive. By the end of December, however, the borrowing powers of your directors had almost been exhausted, and it has been necessary to make provision for the capital expenditure and working losses which will be incurred before the profit-earning stage is reached. This has been done by disposing of 200,000 shares in President Steyn Gold Mining Co. Ltd. and 200,000 units of stock in President Brand Gold Mining Co. Ltd., as a result of which £350,000 has been raised. It is expected that this money will be sufficient to bring the mine to the profit-earning stage. You will be asked to increase the borrowing powers of the directors so that there will be no delay in proceeding with the extensions to the reduction plant and the development required to provide for a monthly tonnage of 100,000 tons.

In due course, consideration will have to be given to the permanent financing of this work, but no share issue is at present contemplated and your directors are of the opinion that temporary finance can best be provided by borrowing.

DEVELOPMENT OPERATIONS

From the start of development operations until the end of March, 1952, 112,659 ft. of development had been accomplished, of which 28,493 ft. were on the Basal Reef and 349 ft. were on the "B" reef. Of the Basal Reef exposed 28,080 ft. were sampled, of which 60.63 per cent proved payable averaging 361 in-dwt. On the "B" reef 345 ft. were sampled of which 23.19 per cent proved payable at an average value of 435 in-dwt. Although it is not possible as yet to estimate the economic importance of the "B" reef it would seem that some tonnages may become available in time from this source.

Two important boreholes have been sunk on your property recently. Towards the end of the year, Borehole No. 1 on the farm "Alma" was put down to locate the major fault which is thought to exist between your property and that of Western Holdings Ltd. This hole intersected the Basal Reef at a depth of 1,295 ft. and gave the very satisfactory value of 112 dwt. over 10.9 in., equal to 1,221 in-dwt. During 1952, Borehole No. 2 was sunk north of Borehole No. 1 on the same farm. After passing through the Gold Estates zone, it was stopped in the footwall without having encountered the Basal Reef. These boreholes indicate that the fault lies further to the west than was first anticipated and prove the existence of a large tonnage of payable ore at a shallow depth. They have assisted materially in planning the underground development of your property.

I must refer with regret to the two fatal explosions which occurred in your mine. The occasional occurrence of gas is not uncommon in a new field, and a similar hazard was encountered in the early days of the East Rand mines. Experience has proved that this type of accident can be avoided by strict adherence to the regulations by all concerned.

President Steyn No. 1 Shaft intersected the Basal Reef towards the end of last year and obtained satisfactory values. The shaft has since been fully equipped and development operations have started. No. 2 Shaft is expected to intersect the Basal Reef shortly. This shaft will be sunk to 5,050 ft. and when equipping has been completed, development will start to meet the haulage being advanced from No. 1 Shaft. It is hoped that it will be possible to start milling on a small scale by the end of the year.

It is expected that President Brand No. 1 Shaft will intersect the Basal Reef horizon towards the end of this year. No. 2 Shaft will not be sunk to the Basal Reef, but will be stopped at the depth of 5,250 ft. and cross-cutting to reef will then be undertaken.

WELKOM TOWNSHIP

Welkom Township has developed rapidly in the last year and is now a well-established community. Proclamation of certain suburbs and the Civic Centre has made it possible for the public to buy stands and obtain transfer of them. The housing programme has kept pace with the mines' requirements and in the Civic Centre several blocks of shops and offices have been erected.

WELFARE OF LABOUR

The supply of native labour has been satisfactory during the year. The hostels for single native employees are now both complete and the improved accommodation and the dining halls have proved popular with the occupants. Every effort is being made to provide recreational and educational facilities under the direction of an experienced welfare officer. A hospital has been constructed for the hospitalization of native employees of the mines administered by the Anglo American Corporation in the Free State. Part of this hospital, which is one of the most modern and well-equipped in Southern Africa, is now occupied. During the year all the mining companies in the Free State agreed to contribute the full cost of building the first unit of the Provincial European hospitals at Virginia, Welkom and Odendaalsrus. These will be built to designs drawn up by the Provincial Administration which will equip and run them.

Copies of the annual report and accounts are obtainable from the London Office of the company, 11, Old Jewry, E.C.2.

FREE STATE GEDULD MINES LTD.

(Incorporated in the Union of South Africa)

MR. H. F. OPPENHEIMER ON DEVELOPMENT OPERATIONS

The Fifth Annual General Meeting of Free State Geduld Mines Ltd., will be held in Johannesburg on May 23.

The following is an extract from a statement by the chairman, **Mr. H. F. Oppenheimer,** dated April 7, 1952, circulated with the annual report and accounts for the year ended December 31, 1951:-

Although shaft sinking operations on the mine were interrupted in both shafts by the frequent intersection of water-bearing fissures, No. 1 shaft, at the end of March, had reached a depth of 4,566 ft., which is about 300 ft. above the expected horizon of the Basal Reef, and No. 2 shaft, which was 5,174 ft. deep, had about 280 ft. to go to the Reef. Both shafts will have to be sunk to a final depth of 5,600 ft. before any major development can be carried out from them.

Work has started in Western Holdings Ltd., on the drive north towards your property, and some underground development of the southern area of the mine in the neighbourhood of Borehole No. 2 on the farm Geduld 197 will be undertaken from this drive which will ultimately connect with No. 2 shaft of your mine. It is probable that the first results of this development work will be available before the end of the year.

In order to locate certain faults and to obtain further information for the planning of underground development, a number of boreholes were sunk during the year.

SATISFACTORY RESULT AT BOREHOLE No. 1

Borehole No. 1 on the farm "Mijannie" intersected the Basal Reef at a depth of 4,829 ft. and gave the very satisfactory result of 349.4 dwt. over 5 in., equal to 1,747 in.-dwt. The Leader Reef assayed 5.15 dwt. over 27.5 in., equal to 142 in.-dwt. The Basal Reef was faulted out in Borehole No. 2 on the same farm, but some interesting results were obtained in the upper reefs. In the Elsburg Series at a depth of 3,833 ft. a reef was intersected giving values of 265 in.-dwt. originally and 343 in.-dwt. in the deflection. The Leader Reef assayed 255 in.-dwt. in the original intersection and 278 in.-dwt. in the deflection.

Borehole No. 1 on Lotgeval No. 196 which obtained poor values in the Basal Reef revealed a throw of 2,000 ft. and the reef was interesected at a depth of 4,457 ft., which was much shallower than was anticipated. In Borehole No. 3 on the farm Rietpan 174, the Basal Reef was encountered at 5,089 ft. and a complete core obtained in the deflection assayed 109 in.-dwt. A reef in the Gold Estates zone assayed 146 in.-dwt. and the "B" Reef yielded 175 in.-dwt. Borehole No. 2 on Hestersrust intersected the Basal Reef at 4,431 ft. and assayed 214 in.-dwt.

From borehole results on your property and neighbouring properties, it appears likely that in due course some additional tonnage of ore may become available from the reefs in the upper series.

DEVELOPMENT OF WELKOM TOWN

The town of Welkom has developed rapidly during the last year and is now a well established community. The civic centre and two suburbs have been proclaimed and members of the public are now able to purchase stands. The housing programme has gone ahead satisfactorily and has kept pace with the requirements of the mines.

Copies of the annual report and accounts may be obtained from the London office of the company, 11, Old Jewry, E.C.2.

PRESIDENT STEYN GOLD MINING CO., LTD.

(Incorporated in the Union of South Africa)

SHAFT SINKING PROGRESS

MR. H. F. OPPENHEIMER'S STATEMENT

The Fourth Annual General Meeting of President Steyn Gold Mining Co. Ltd., will be held in Johannesburg on May 23.

The following is an extract from the statement by the chairman, **Mr. H. F. Oppenheimer,** dated April 7, 1952, circulated with the annual report and accounts for the year ended December 31, 1951:

Some delays were experienced through the intersection of water-bearing fissures, but good progress was made in shaft sinking at your mine during 1951. In October, 1951, No. 1 shaft intersected the Basal Reef at a depth of 4,152 ft. Samples were taken at 5 ft. intervals round the perimeter of the shaft and gave the satisfactory average value of 36.66 dwt. over 6.41 in. which is equivalent to 235 in.-dwt. No. 2 shaft is expected to intersect the Basal Reef shortly.

No. 1 shaft was stopped temporarily at a depth of 4,450 ft. to allow an early start to be made on the main connecting haulage with No. 2 shaft. The ventilation wall was completed in record time and by the beginning of March the shaft was equipped and work was started on the main ore passes and in the development drives. It is proposed to develop on four levels but it will be some time before the necessary cross-cutting in country rock is completed on all levels. Towards the end of March, the reef was intersected on 4,250 level and 26 ft. of reef were exposed. Sixty per cent proved payable at an average value of 38.32 dwt. over 9.33 in. equivalent to 358 in.-dwt.

It is proposed to continue sinking No. 1 shaft to a depth of 5,250 ft. while development work is proceeding. Sinking will therefore continue at a reduced speed so as not to interfere with development.

COMMENCEMENT OF PRODUCTION

Your company's technical advisers have recommended that No. 2 shaft which is now 4,894 ft. deep should be finally stopped at 5,050 ft. and, as soon as the shaft is fully equipped, development operations will start to meet the haulage being advanced from No. 1 shaft. It is essential that the connection between the two shafts should be made as soon as possible so that stopes can be started. The erection of the reduction plant is well advanced and it will be possible to run the plant for metallurgical tests using rock from development before any tonnage is available from stoping. Every effort will be made to carry out the rapid underground development of your mine and it is hoped that production on a limited scale will start early in 1953, and that monthly working profits will be earned from about the middle of 1953, onwards. Revenue from sales of gold before monthly working profits are earned will assist materially in financing your company's operations during the first half of 1953.

The registered options on £2,500,000 of five per cent Registered Unsecured Convertible Notes expire on April 30, 1952. This issue has been underwritten by the Anglo American Corporation of South Africa Ltd. and the company will receive £2,500,000 soon after April 30, 1952.

INCREASE OF AUTHORIZED CAPITAL

Advantage is being taken of the annual general meeting to place before shareholders a resolution increasing the authorized capital of the company from £2,500,000 to £3,000,000, divided into 12,000,000 shares of a nominal value of 5s. each. It is not the intention of your directors to issue these shares immediately, and you will, therefore, be asked to pass the usual resolution empowering the directors to do so as and when they think it advisable.

In order to obtain further technical information for planning the development programme in the vicinity of No. 2 shaft, two boreholes have been drilled on the property since March, 1951. Borehole K.P.9 intersected the Basal Reef at a depth of 4,450 ft. and yielded the high value of 906. in.-dwt. Borehole K.P.10 intersected the Basal Reef at 5,224 ft. and gave an assay value of 184 in.-dwt.

DEVELOPMENT OF WELKOM TOWN

The development of the town of Welkom has gone ahead very satisfactorily. Since the end of the year two residential suburbs and the Civic Centre of the town have been proclaimed and it is now possible for the public to purchase and obtain transfer of stands in these areas. Several large blocks of shops have already been constructed in the shopping area and industries are being established. The housing requirements of the mines have been fully met by the building programme undertaken by the Anglo American Housing Co.

During the year all the mining companies in the Orange Free State agreed to contribute the full cost of building the first units of Provincial European hospitals at Virginia, Welkom and Odendaalsrus. These hospitals are to be built to designs prepared by the Provincial Authority which will bear the cost of equipping and running them.

Copies of the annual report and accounts are obtainable at the London office of the company, 11, Old Jewry, E.C.2.

PRESIDENT BRAND GOLD MINING CO., LTD.

(Incorporated in the Union of South Africa)

PROVISION OF FURTHER FINANCE

MR. H. F. OPPENHEIMER'S STATEMENT

The Third Annual General Meeting of President Brand Gold Mining Co. Ltd., will be held in Johannesburg on May 23.

The following is an extract from the statement by the chairman, **Mr. H. F. Oppenheimer,** dated April 7, 1952, circulated with the annual report and accounts for the year ended December 31, 1951:-

During the year the sinking of both the shafts on your property was frequently delayed by the intersection of water-bearing fissures and by the friable nature of the ground, but by the end of March, 1952, No. 1 shaft had reached a depth of 3,946 ft. which is about 500 ft. above the estimated level of the Basal Reef and No. 2 shaft had been sunk to a depth of 2,999 ft.

Soon after the intersection of reef in No. 1 shaft work will be started on a haulage to connect the two shafts and on reef development.

It is proposed to stop No. 2 shaft at a depth of 5,250 ft. and to proceed with the drive northwards to connect with No. 1 shaft. In order to carry out development from this shaft it will be necessary to cross-cut in country rock to the Basal Reef and instead of continuing the shaft so as to have access to the Basal Reef in the southern portion of your mine, consideration is being given to the possibility of sinking a sub-vertical shaft from this horizon.

Good progress has been made on the erection of buildings at the mine. Since the end of the year construction of the permanent road between Nos. 1 and 2 shafts has started and work is going ahead on the third dormitory block and the medical control block of the native hostel at No. 1 shaft. The erection of the permanent headgear bins at both shafts is proceeding satisfactorily.

DEVELOPMENT OF WELKOM TOWNSHIP

The development of Welkom Township reached an important stage towards the end of the year with the official proclamation of two of its suburbs and the civic centre. Since then, the necessary formalities have been completed with the local authorities and early in March it became possible for the public to purchase and obtain transfer of residential and business stands. The shopping areas in the town are growing rapidly and several large blocks of shops and offices have been built. Adequate housing has been available for married employees of your mine during the year.

INCREASE OF AUTHORIZED CAPITAL

During 1951 an offer of 2,500,000 shares was made to shareholders at a price of £1 per share. The company had £720,500 in hand at the end of the year. It is likely that this amount will be exhausted shortly, but adequate borrowing facilities have been arranged so that the operations at the mine can be financed for some time. Advantage is being taken of the annual general meeting to place before shareholders a resolution increasing the authorized capital of the company from £2,000,000 to £3,000,000 divided into 12,000,000 shares of a nominal value of 5s. each. It is not the intention of your directors to issue these shares immediately, and you will, therefore, be asked to pass the usual resolution empowering the directors to do so as and when they think it advisable.

Copies of the annual report and accounts are obtainable from the London office of the company, 11, Old Jewry, E.C.2.

THE BRITISH ALUMINIUM CO. LTD.

GREATLY INCREASED DEMAND

The Annual General Meeting of the British Aluminium Co. Ltd. was held on May 6 at Grosvenor House, Park Lane, London, **Mr. R. W. Cooper, O.B.E., M.C.,** chairman of the company, presiding.

The chairman said that the consolidated income for the year amounted to £3,445,871 which represented a substantial increase on the figure recorded last year. This increase had derived chiefly from their Fabricating plants and had been mainly due to three factors. Firstly, a very firm demand for their products had enabled them to plan output at their rolling mills so as to make the best possible use of the plant employed. As pointed out on previous occasions, a market which allowed for long-term planning had a very great effect on efficiency. Unfortunately, however, those conditions seldom ruled for long periods and therefore could not prudently be brought into account when fixing prices. The second factor had been the increased use to which they had been able to put their new extensions at Falkirk previously referred to and which had now got over their main teething troubles and were becoming of ever increasing use to the company. Thirdly, there had been the utilization of scrap metal stocks purchased some time ago at low prices and which were converted at their Latchford works into secondary alloys. Unfortunately those stocks had now been consumed, and it was becoming increasingly difficult to find adequate quantities of scrap metal at attractive prices, so that they must expect in the near future some reduction in the profits which had been derived from this source. There were indications, however, that scrap supplies might increase in the not too distant future, with some consequent alleviation in the sellers' market in the scrap field which existed at present.

OVERWHELMING BURDEN OF TAXATION

At this point, however, attention was drawn to the fact that while the profit as shown above represented an increase, the net profit after taxation did not provide a sufficient margin for the maintenance and normal expansion of their capital assets. The overwhelming burden of taxation which had to be borne by industry in this country at the present time was placing them at an ever increasing disadvantage in relation to their competitors in many countries overseas where more generous and often special depreciation allowances made it possible for profits to be ploughed back into industry in the form of new plant and equipment. The inability of industry in this country to re-invest in this manner and the necessity for raising fresh capital for modernization and the building up of manufacturing equipment was a constant source of worry to those responsible for industrial management and one which, unless measures were taken to alleviate it, would place British industry at an ever increasing disadvantage in world trade.

During the year the fixed Government price for virgin aluminium remained at £124 per ton but was increased to £148 per ton on the 1 January, 1952.

On April 1 last, the Government announced a further increase in the price to £154 per ton. Apart from the inevitable variations in price of their semi-fabricated products made necessary by those changes in the price of ingot they had been able to retain a very great degree of stability in the price of such products, although minor adjustments had had to be made to cover increases in wages and other materials and services outside their control.

BAUXITE SUPPLIES

They had continued to obtain their supplies of bauxite partly from their French company, Union des Bauxites, and partly from their mines on the Gold Coast. In the case of the latter mines they were incurring considerable expenditure in improving the equipment and facilities. They had not yet secured any benefit from this expenditure but it should begin to bear fruit during the current year.

It would be appropriate, while dealing with bauxite supplies, to make reference to the enormous increases which took place last year in sea freights and, to a lesser degree, inland transport charges. The production of aluminium ingot was an industry in which a great weight of material had to be moved from one place to another and these increases had had a profound effect on costs and caused them great concern. The average freight rates throughout 1951 were two and a quarter times greater than for 1950. The position at the present time was fortunately easier.

Their alumina works at Burntisland and Newport had worked satisfactorily throughout the year. Improved yields had resulted both from plant reconstruction and from the results of process research.

Operations at their reduction works had been reasonably satisfactory. The output had been somewhat reduced by their inability to maintain a full labour force. Progress has been somewhat delayed in the reconstruction of their Lochaber works since there was difficulty in obtaining materials. Some inevitable technical troubles with their new and very large furnaces had been overcome and these furnaces were now operating with encouraging results.

The output from their rolling mills was again increased but had been limited by inability to obtain sufficient metal to work them to their full capacity. They would, no doubt, have seen references in the Press to a world shortage of aluminium ingot which had necessitated strict rationing of available supplies by the Government and the introduction of a voluntary allocation scheme to customers throughout industry. Defence requirements had, of course, been given first priority and these had been met to the full. It was a matter of great regret that in consequence of these restrictions they had had to curtail supplies to old and valued customers, both at home and overseas. They very much hoped that the time would soon return when they would be able to meet these requirements in full.

DEMAND FOR PRODUCTS

The demand for their products, particularly sheet and strip, increased greatly throughout the year, quite apart from defence requirements and it was disappointing that they should be so heavily restricted in metal supplies at a time when so many new uses for their material were taking such promising shape. They had, however, a picture which gave them great confidence in the continued development of the use of their metal after the completion of the current rearmament programme and they looked to the day when they could turn their whole resources to the service of normal progress. They also looked forward to the day when they could direct more of their efforts to the building up of their export business which had of necessity been curtailed at the Government's request owing to the shortage of ingot metal, and to defence requirements.

Turning to the Accounts the total consolidated income for the year was £3,445,871 which was an increase over last year of £1,254,375.

The Fixed Assets amounted to £18,099,110 as compared with £17,437,113 a year ago which was a net increase of £661,997. The bulk of this expenditure had been at their rolling mill at Falkirk and their bauxite mines on the Gold Coast. The extensions at their Falkirk factory were now very well advanced, but a certain amount of additional expenditure would be necessary during the present year. The Gold Coast re-equipment programme was not yet completed, so that further expenditure was still being incurred.

The sum of £538,324 had been set aside for Depreciation Reserve, and after making adjustments for assets scrapped and sold during the year, the Reserve now stood at £5,532,530.

Expenditure on development had been increased by £9,619 bringing the total amount up to £71,240 against which full provision had now been made out of profits. This expenditure was wholly incurred overseas in exploring for potential power supplies suitable for the production of aluminium. Investments in Allied Companies showed an increase of £265,497. This increase represented principally the purchase of additional shares in the Australian Aluminium Co. Pty. Ltd. They had also increased their advances on loan to Aluminium Wire & Cable Co. Ltd.

CURRENT ASSETS AND LIABILITIES

The excess of Current Assets over Current Liabilities was now shown at the very satisfactory figure of £8,640,278 which was a further increase over last year of £2,061,616.

The Capital Reserves showed little change except that the Reserve for Plant Replacements had been increased from £562,625 to £872,337 and it was still necessary to build up this Reserve to help them meet the present high cost of replacing worn out and obsolete plant.

The total amount of the Revenue Reserves was £7,358,768 as compared with £6,455, 239 a year ago, an increase of £903,529.

After deducting from the total profit of the Parent Company Directors' Fees, Provision for Profits Tax and Income Tax based on the profits of the year, and the various other allocations and provisions set out in the Directors' Report they were left with the sum of £373,765. After taking into account the dividend for the year on the Preference Stock they recommended a final dividend of 6 per cent on the ordinary stock, which with the 4 per cent already paid, made 10 per cent less tax for the year, and they also recommended payment of a cash bonus on the Ordinary Stock of 2 per cent less tax.

As those who had attended previous meetings would know from informal remarks it was felt for some time past that the Chairman's retirement should not be delayed over long. He had, however, been pressed by his colleagues to remain in the Chair and had so far yielded to this pressure. Recently he informed his directors that he felt he must retire at the end of the current year, hard though this would be after more than 40 years on the Board and 25 years as Chairman. It would, he knew, please them to learn that Lord Portal had agreed to succeed him as Chairman. He was confident that he could hand the position over to him in the knowledge that the company's interests would always be his first consideration and that he would preserve the happy relationships which existed between his colleagues.

The report was adopted.

OMCOL

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RAND MINES, LIMITED

(Incorporated in the Union of South Africa)

BALANCE SHEET, 31st DECEMBER, 1951

CAPITAL AND LIABILITIES

Share Capital—Registered 2,200,000 Shares of 5s. each, £550,000. Less 49,005 Shares of 5s. each in reserve, £12,251.	
Issued—2,150,995 Shares of 5s. each	£537,749
Investment Reserve—As per Balance Sheet, 31st December, 1950, £4,648,615. **Add**—Amount realized by the sale of Investments during the year ended 31st December, 1951, less book value thereof and amounts written off Investments and Freehold Properties, £310,133	4,958,748
Shareholders—Dividends declared but unpaid, £464,411. Contingency Reserve pending claims for dividends forfeited since September, 1939, £105,500. **Trustees of the Corner House Pension Fund,** £834,000. **Creditors and Provisions,** £382,766	1,786,677
Exploration Reserve—As per Balance Sheet, 31st December, 1950, £337,197. Less—Expenditure on Ventures charged thereto, £40,524—£296,673. **Add**—Transfer from Appropriation Account, £50,000	346,673
Appropriation Account—Balance Unappropriated	1,743,566
Contingent Liabilities There are Contingent Liabilities as under, viz:—I.—To finance and to subscribe for shares in certain undertakings. II.—To guarantee housing loans to employees. III.—For contracts open for the supply of Stores, etc. IV.—To guarantee commitments of associated Companies.	
	£9,373,413

PROPERTY AND ASSETS

Freehold Properties and Ventures at cost *less* depreciation	£2,421
Shares, Debentures, etc., at or below cost but not exceeding market value, or Directors' valuation, where not quoted	5,525,614
Shares in Subsidiary Companies, at or below cost, but not exceeding Directors' valuation	42,888
Plant, Stores, Vehicles, Furniture, etc., at cost *less* depreciation	30,509
Advances to Subsidiary Companies	39,900
Debtors, Loans and Payments in Advance, etc.	237,832
Deposits, Fixed and on Call	2,086,129
Government Stocks, etc.	850,645
Cash at Bankers and in Hand	111,205
Dividends to be received on Shareholdings	446,270
	£9,373,413

APPROPRIATION ACCOUNT

Taxation	£44,075	**Balance Unappropriated—** As per Balance Sheet, 31st December, 1950	£1,640,937
Forfeited Dividends Account	27,261	**Balance of Profit and Loss Account—** For the year ended 31st December, 1951	949,513
Transfer to Exploration Reserve	50,000	**Transfer from Shareholders Contingency Reserve**	27,300
Dividend Account— Dividend No. 96 of 3s. 6d. per share, declared 12th June, 1951, £376,424. Dividend No. 97 of 3s. 6d. per share, declared 13th December, 1951, £376,424	752,848	NOTE. — The Accounts have been drawn up in accordance with the normal practice of the Company; an amount of £310,133 realized by the sale of Investments during the year, less book value thereof and amounts written off Investments and Freehold Properties having been dealt with through the Investment Reserve shown in the Balance Sheet	
Balance Unappropriated— 31st December, 1951—Carried to Balance Sheet	1,743,566		
	£2,617,750		£2,617,750

The full Report and Accounts may be obtained from the London Secretaries, A. Moir & Co., 4, London Wall Buildings, London, E.C.2.

ANGLO-TRANSVAAL CONSOLIDATED INVESTMENT CO. LIMITED

Mining Companies' Directors' Reports for Quarter Ended 31st March, 1952

Following are the reports on work done during the quarter ended 31st March, 1952

EASTERN TRANSVAAL CONSOLIDATED MINES, LIMITED

The total tonnage treated during the Quarter ended 31st March, 1952, by the four gold mines operated by this Company amounted to **54,588** tons, resulting in a Working Profit (including Sundry Revenue) of **£47,777** for the Quarter.

Revenue from the sales of gold at higher than standard prices, sold for manufacturing purposes during the three months ended 31st March, 1952, amounted to **£7,750**, making a Total Profit for the Quarter of **£55,527.**

The Profit, as shown above, does not take into consideration the amount, estimated at £24,000 for the Quarter, payable to the Government in Mining Taxation Capital Expenditure for the Quarter amounted to **£9,232.**

SHAFT SINKING

NEW CONSORT—The Prince Consort sub-vertical shaft was sunk **127** feet during the Quarter to a total depth of **1,971** feet. In addition, **23,324** cubic feet were excavated in station and ore-pass cutting.

AGNES—The Ivy Shaft was sunk **8** feet during the Quarter, to a total depth of **1,073** feet. In addition, **26** feet of station cutting were advanced.

GENERAL—The Ben Lomond Tunnel was advanced **342** feet during the Quarter to a total length of **3,742** feet.

MERRIESPRUIT (ORANGE FREE STATE) GOLD MINING COMPANY, LIMITED

SHAFT SINKING

No. 1 VERTICAL SHAFT was sunk **203** feet in Ventersdorp Sediments to a total depth of **2,788** feet. In addition, **55,803** cubic feet were excavated in work associated with the cutting of the first station at a depth of **2,600** feet below the collar and the brow box. The Shaft was concrete lined to a depth of **2,752** feet, of which **185** feet were accomplished during the Quarter. Sinking operations were suspended for a period of **10** days due to a serious accident caused by damage to the sinking platform. The intersection in pilot holes of water bearing fissures, requiring cementation, considerably delayed shaft sinking operations.

No. 2 VERTICAL SHAFT—No sinking work was done during the Quarter.

SHAFT EQUIPMENT—Work commenced on the erection of the permanent steel headgear at No. **1** Shaft. The manufacture of the prefabricated reinforced concrete buntons for the final equipping of No. **1** Shaft has been completed.

LABOUR—The Labour strength at the end of the Quarter was: Europeans **49,** Natives **461.**

CAPITAL EXPENDITURE—Capital Expenditure amounting to **£133,132** was incurred during the Quarter on shaft sinking, buildings and plant. The total Capital Expenditure, including preliminary expenses, incurred to 31st March, 1952, amounted to **£1,887,000.**

VIRGINIA ORANGE FREE STATE GOLD MINING COMPANY LIMITED

SHAFT SINKING

No. 1 VERTICAL SHAFT was sunk **347** feet in quartzites of the Upper Witwatersrand System to a total depth of **3,766** feet. In addition, **50,568** cubic feet were excavated in the cutting of the second station and brow-box, and in the enlarging of the Shaft at the reef horizon. A reef, occupying the Leader-Basal Reef horizon, was intersected at a depth of **3,756** feet below the collar and a full exposure of the reef over the periphery of the Shaft was completed at a depth of **3,765** feet below the collar. The reef was sampled at **5** feet intervals around the periphery of the Shaft and **16** Sections sampled gave an average value of **6.33** dwts over a channel width of **53.7** inches, equivalent to **340** inch-dwts. The Shaft was concrete-lined to a depth of **3,760** feet, of which **373** feet were accomplished during the Quarter. The intersection in pilot-holes of water-bearing fissures, requiring cementation, considerably delayed sinking operations.

No. 2 VERTICAL SHAFT. No sinking was done during the Quarter at this Shaft, which was stopped temporarily during November, 1951, at a depth of **2,909** feet. The Leader-Basal Reef was exposed in the vertical winze sunk from the 12th Level at the elevation of **2,880** feet below the Collar, at a point **39** feet South of the centre of No. 2 Shaft. The ground in the winze was found to be disturbed by faulting, which caused duplications of the reef. Intersections of the reef were made between vertical depths of **3,171** feet and **3,191** feet below the collar elevation of No. 2 Shaft. The reef was sampled at **2½** feet intervals and gave the following results:—

Depth of Reef below Collar (Feet)	Channel Width (Inches)	Value (Dwts.)	Inch-Dwts.	Remarks
3,171–3,185	11.9	5.8	69	Average of three faulted remnants of reef.
3,191	10.0	10.0	100	Complete exposure of reef.

SHAFT EQUIPMENT

No. 1 VERTICAL SHAFT—The initial erection programme of the permanent headgear has been completed. The steel-work of the permanent Winder House has been erected, and progress is being made with the brick panels.

No. 3 VERTICAL SHAFT—The 450 H.P. electric winder has been converted to a double-drum unit and the cages are now operating in the Shaft.

DEVELOPMENT—A total of **5,316** feet of development was accomplished during the Quarter, and in addition **83,168** cubic feet were excavated in pump-chambers, sumps and service bays. The following are the results of the Quarter's development:—

	No. 2 Shaft	No. 3 Shaft	Totals and Averages
Footage Advanced	1,911	3,405	5,316
Footage on Reef	—	2,145	2,145
Footage Sampled	—	2,040	2,040
Payable Footage Sampled—			
Footage	—	580	580
Percentage Payable	—	28.4	28.4
Channel Width—Inches	—	25.6	25.6
Channel Value—Dwts.	—	9.49	9.49
Inch-Dwts.	—	243	243

(The above results are based on actual sampling. No allowance has been made for adjustments necessary in the valuation of the corresponding Ore Reserve.)

A breakdown of one of the Main 1,000 H.P. Compressor Units, and an accident involving the hoisting equipment at No. 3 Shaft partially affected development operations, for periods of 5 and 4 days respectively.

REDUCTION PLANT—As the Reduction Plant was sufficiently advanced to permit of its completion in a short time, major construction work was suspended towards the end of the Quarter. Present work is confined to those sections which are nearly completed, and on those structures and excavations which would suffer deterioration if work on them were postponed. Work will be resumed shortly before the Mine is ready for supplying ore.

EUROPEAN HOUSING—During the Quarter, a further 10 houses were completed and occupied, bringing the total of houses completed in the permanent quarters to 142. At the end of the Quarter, 313 families and 137 single persons were accommodated in the permanent and temporary quarters.

NATIVE COMPOUNDS—At the end of the Quarter, **1,890** Natives, including **93** Contractors' employees, were housed in the permanent compounds. The permanent kitchen at No. 1 Shaft Compound has been completed.

MINE BUILDINGS AND PLANT—Work was commenced on the erection of a **19,000** cubic feet per minute turbo-compressor, and on foundations for another similar unit. Extensions to the Compressor House have been completed. The brick panels of the initial portion of the permanent Workshops are well advanced.

LABOUR—The labour strength at the end of the Quarter was:—Europeans **313,** Natives **1,800.**

CAPITAL EXPENDITURE—Capital Expenditure, amounting to **£802,006,** was incurred during the Quarter on shaft sinking, buildings and plant.

The total Capital Expenditure, including preliminary expenses, incurred to 31st March, 1952, amounted to **£4,590,431.**

MIDDLE WITWATERSRAND (WESTERN AREAS), LIMITED

INTERESTS IN THE ORANGE FREE STATE

MINERAL RIGHTS—Your Company's interests in the Orange Free State consist of Mineral Rights purchased over **12,099** morgen in the Virginia Area; the farm van den Heeversrust No. 419, measuring **629** morgen, situate North-West of Odendaalsrus; the farm Klein Begin No. 911, measuring **129** morgen, adjoining the Western boundary of the Freddies North Lease Area; the farm Stephanus Rust No. 897 measuring **209** morgen, situate West of Odendaalsrus, and over a one-half undivided share of the farm Remaining Extent Wesselsgunst No. 261, measuring **58** morgen 1½ square roods, situate immediately North of the Freddies North Lease Area Limited.

Your Company retains its interest in Option Contracts over the farm Britzpan No. 1289, district Odendaalsrus, measuring **229** morgen; over **1,175** morgen in the Winburg district, and a participation in subscription rights accruing to Lydenburg Estates, Limited, in respect of certain of that Company's interests in the Orange Free State.

INTERESTS IN THE POTCHEFSTROOM AND KLERKSDORP DISTRICTS OF THE TRANSVAAL

MINERAL RIGHTS—Your Company owns the Mineral Rights of the Eastern portion of the Klerksdorp Townlands, measuring **4,557** morgen approximately, and a **98.4** per cent share of the Mineral Rights of a portion of the farm Elandsheuvel No. 54, district Klerksdorp, measuring **254** morgen **375** square roods.

Your Company retains its interest in options to purchase the Surface and Mineral Rights of certain portions of the farm Palmietfontein No. 29, district Klerksdorp, totalling **1,188** morgen approximately.

SURFACE RIGHTS—During the Quarter, your Company disposed of the farms Etta No. 23 and Safsit No. 58, district Potchefstroom, held under Crown Grant.

REPORT FOR QUARTER ENDED 31st MARCH, 1952. A Total of **6,207** feet was drilled in **7** Boreholes.

Borehole No.	Drilled on joint account with	Farm	Depth at 31st March, 1952 Feet	Formations traversed during Quarter: Borehole Depths (feet) From	To	Description	Reef	Reefs intersected: Depth feet	Value dwts.	Corrected width inches	Inch-dwts.	Remarks
VDH. 6/51	General Exploration Orange Free State, Limited	Van den Heeversrust No. 419, District Odendaalsrus	6,466 Original borehole completed on 18th February, 1952	5,610	6,273	Witwatersrand Sediments	Leader	6,222	0.15	17		Borehole width
					6,273	Hangingwall of Basal Reef						
			Deflection in progress	6,273	6,466	Fault Footwall of Basal Reef						
T.L. 20/47		Klerksdorp Townlands No. 44, District Klerksdorp	3rd Deflection completed on 31st January, 1952				Vaal Reef	1,489	1.07	13.3	14	2nd Deflection. Faulted portion of Vaal Reef.
							Vaal Reef	1,491	1.00	6.7	7	3rd Deflection. Faulted portion of Vaal Reef.
TL. 30/52		Klerksdorp Townlands No. 44, District Klerksdorp	2,440 In progress	0	60	No Core						
				60	1,282	Ventersdorp Lava						
				1,282	1,602	Ventersdorp Upper Sediments						
				1,602	2,440	Ventersdorp Lava						
TL. 31/52		Klerksdorp Townlands No. 44, District Klerksdorp	675 Original borehole completed on 6th March, 1952	0	76	No Core						
				76	147	Ventersdorp Lava						Vaal Reef eliminated by faulting.
				147	516	Elsburg Series						
			Deflection completed on 11th March, 1952	516	537	Vaal Reef Hangingwall						
					537	Faulting						
				537	675	Vaal Reef Footwall						
TL.32		Klerksdorp Townlands No. 44, District Klerksdorp	737 Original borehole completed on 10th March, 1952	0	132	Witwatersrand Sediments	Vaal Reef	666	1.7	39	66	Incomplete Core recovery.
				132	154	Intrusive	Uncorrelated	672	3.88	13	50	
			Deflection completed on 19th March, 9952	154	519	Ventersdorp Lava	Vaal Reef	665	1.57	50.3	79	Deflection.
				519	519	Reverse Fault	Uncorrelated	673	3.9	13.8	54	
				519	523	Dolomite						
				523	531	Black Reef Series						
				531	737	Witwaterarand Sediments						
TL.33		Klerksdorp Townlands No. 44, District Klerksdorp	700 In progress	0	587	Ventersdorp Lava						
				587	700	Witwatersrand Quartzites						
TL.34		Klerksdorp Townlands No. 44, District Klerksdorp	295 In progress	0	295	Ventersdorp Lava						

In addition, the Company is participating in the drilling of the following boreholes in the Orange Free State:—

Borehole Number	Farm	Drilled by
WN.6	Weltevreden No. 205, District Odendaalsrus	General Exploration, Orange Free State, Limited
BH.2 (SB.2)	Spes Bona No. 921, District Odendaalsrus	General Exploration, Orange Free State, Limited
BH.2. (RD.2)	Rosedale No. 898, District Odendaalsrus	General Exploration, Orange Free State, Limited
ERK.1	Energie No. 896, District Odendaalsrus	Free State Development and Investment Corporation, Limited

DRILLING IN THE STILFONTEIN-HARTEBEESTFONTEIN AREA (LUCAS BLOCK)

During the Quarter ended 31st March, 1952, a total of **1,566** feet was drilled on joint account with the Strathmore Development Company, Limited, in the following 3 Boreholes:—BU.4, BU.5, WI.2. Boreholes BU.4 and BU.5 were completed during the Quarter and a deflection of Borehole WI.2 is still in progress.

The following results of Assay Values of Vaal Reef intersections were published during the Quarter:—

Borehole Number	Depth (Feet)	Value (Dwts.)	Corrected Width (Inches)	Inch-Dwts.	Remarks
BU.4	8,186	13.54	14.5	196	2nd Deflection. Core recovery incomplete.
	8,185	15.47	14.6	226	3rd Deflection. Core recovery complete. The Vaal Reef was eliminated by faulting in the original borehole and in the 1st Deflection.
BU.5	8,251	17.92	21.3	382	Core recovery nearly complete.
	8,249	59.6	14.7	876	Deflection. Core recovery complete.
WI.2	8,591	25.5	14.0	357	Core recovery incomplete. Reef disturbed by faulting.
	8,586	12.77	27.2	347	Deflection.

NEW KLERKSDORP GOLD ESTATES, LIMITED

Tons Milled—**31,570** yielding **3,621.94** ounces fine.

Revenue from Gold	£44,957
Working Costs	£42,102
	£2,855
Sundry Revenue	£354
Working Profit for Quarter	£3,209
Working Costs per Ton Milled	28s. 8d.
Working Costs per fine ounce recovered	232s. 6d.

In addition to the above revenue, **£1,854** accrued in respect of increased revenue from sales of gold at higher than standard prices, sold for manufacturing purposes during the three months January to March, 1952, inclusive. The working profit for the Quarter, as shown above does not take into consideration interest on loan amounting to **£1,379** for the Quarter.

No liability was incurred for Mining Taxation payable to the Government in respect of the profits earned for the Quarter.

CAPITAL EXPENDITURE—The expenditure on Capital Account for the Quarter amounted to **£4,658.**

DEVELOPMENT—The total footage advanced during the Quarter amounted to **1,330** feet. Of **1,085** feet sampled, **285** feet, equal to **26.3** per cent, were classed as payable at an average value of **3.79** dwts., over a channel width of **42** inches, equivalent to **159** inch-dwts. (The above results are based on actual sampling. No allowance has been made for adjustments necessary in the valuation of the corresponding Ore Reserve.)

RAND LEASES (VOGELSTRUISFONTEIN) GOLD MINING COMPANY, LIMITED

PRODUCTION

Tons Crushed: **555,000** yielding, **93,147** ounces fine.

		Per Ton Crushed
Revenue from Gold	£1,156,187	41s. 8d.
Working Costs	£937,829	33s. 10d. (201s. 4d. per oz. fine)
	£218,358	7s. 10d.
Sundry Revenue	£13,500	0s. 6d.
Working Profit for Quarter	£231,858	8s. 4d.

Working Costs per ton, **33s. 10d.**, include **5s. 6d.** in respect of development expenditure.

In addition to the above revenue, **£38,899** accrued in respect of increased revenue from the sales of gold at higher than standard prices, sold for manufacturing purposes during the three months January to March, 1952, inclusive.

The Working Profit for the quarter, as shown above, does not take into consideration the amount, estimated at **£94,000** for the Quarter, payable to the Government in Taxation and as its share of the profits in terms of the Mining Lease.

CAPITAL EXPENDITURE—The expenditure on Capital Account for the Quarter amounted to **£16,467.**

SHAFT SINKING

No. 2 KIMBERLEY REEF INCLINE SHAFT—A total of **878** feet of shaft length has been sliped to full dimensions, of which **245** feet were done during the Quarter.

DEVELOPMENT

A total of **17,272** feet of shaft sinking and development was accomplished during the Quarter, of which **7,885** feet were sampled, showing **4,285** feet, equal to **54** per cent, as payable. Payable reef disclosures were distributed as follows:—

Reef	Footage Sampled	Payable				
		Feet	Percentage	Channel Width	Channel Value	Inch-Dwts.
Main Reef	980	740	76	34.0	5.42	184
Main Reef Leader	2,750	1,680	61	12.0	23.16	277
South Reef	855	455	53	8.4	34.59	290
Total Main Reef Series	4,585	2,875	63	17.1	14.96	255
Bird Reef	1,140	510	45	47.7	3.87	184
Kimberley Reef	2,160	900	42	57.6	3.06	176
Totals and Averages	7,885	4,285	54	29.2	7.88	230

(The above results are based on actual sampling. No allowance has been made for adjustments necessary in the valuation of the corresponding Ore Reserve.)

VILLAGE MAIN REEF GOLD MINING COMPANY (1934), LIMITED

PRODUCTION

Tons Treated: **101,600** yielding **15,832** ounces fine.

		Per Ton Treated
Revenue from Gold	£197,035	38s. 9d.
Working Costs	£147,308	29s. 0d. (186s. 1d. per ounce fine)
Working Profit for Quarter	£49,727	9s. 9d.

Working Costs per ton **29s. 0d.** include **5s. 6d.** per ton in respect of Development Expenditure.

In addition to the above revenue **£5,751** accrued in respect of increased revenue from the sales of gold at higher than standard prices, sold for manufacturing purposes during the three months January to March, 1952.

The Working Profit for the Quarter, as shown above, does not take into consideration interest on Loans, amounting to **£497** for the Quarter, nor the further amount payable to the Government in respect of Mining Taxation, estimated at **£24,000** for the Quarter.

CAPITAL EXPENDITURE—The Expenditure on Capital Account during the Quarter amounted to **£304.**

DEVELOPMENT—7,952 feet of development were advanced during the Quarter, and **3,708** feet of old drives and crosscuts were reconditioned. In addition, **869** feet of underground diamond drilling was done as an aid to development.

ANGLO-TRANSVAAL COLLIERIES, LIMITED

The Sales Output of the Subsidiary Collieries controlled by this Company for the Quarter ended 31st March, 1952, totalled **259,843** tons.

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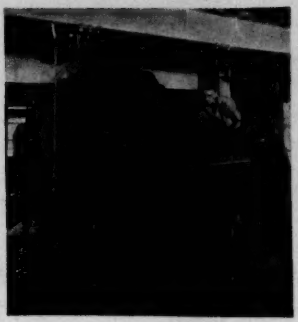

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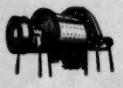

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